



Bluetooth Vs WiFi Vs Infra-red

Highly recommended online storage sites

Rs 100 Subscriber Copy NOT FOR SALE

January 2004

www.thinkdigit.com

digit

>> Your Technology Navigator

ICONS OF TRUST

India's FIRST EVER survey on **SERVICE & RELIABILITY**



12 LAPTOP BRANDS compared
Your search ends here!

STOP THIEF! Cool tools to secure your laptop while you are away



Are Office Alternatives for real?
We test 5 OPTIONS to see if ANY survive in an MS-Office world

Don't get caught napping! The new breed of **ROBOTS** just might **REPLACE YOU**



Digital Photography: A TIP-A-DAY programme to impress friends through the month



PLUS

Managing your fonts

Send a fax without a fax machine!

Reviewed: Sony Ericsson T610, Epson Stylus C63

Jasubhai
DIGITAL MEDIA
International price: United States \$5

Relationship Mines

Relationships are born out of interactions and communications. When you talk to a neighbour, when you forward that funny e-mail to 20 of your friends, or send a project update to a client, your relationships are being nurtured. Electronic communications are forming the most used pathways to your friends and associates, and inevitably that leaves a trail of electronic conversations.

How would you react to software that wants to watch this conversation? It is initially counter-intuitive, but your relationships have huge latent value to everyone involved in them that may not be fully used.

Social software that try to mine your relationships, and create a visible network of your links to people around you, are all the rage. Services such as LinkedIn, Spoke and Friendster, all offer different perspectives on the same basic theme—you may know someone who is important to someone else, and someone you know, could introduce you to an important person.

But all these software fail to account for the variability in strength and quality of the relationships. Not everyone in your address book is equally well-connected to you. There may be imbalances in relationships, where you feel it is stronger or weaker than it really is. These services try to classify relationships, by asking you to pick from a list of predefined labels, but that can be too limiting in scope.

Building and maintaining relationships is a sustained effort that requires grace and empathy—precisely the qualities that are hard to be captured by software. All these services are in the first generation, and bound to be simplistic; but it is inevitable that as the power of mining these networks becomes apparent, inferring and capturing nuances of relationships will be top priority.

The emergence of such social software is an interesting pointer to the kind of assistance that can be expected from computers in the near future; very different from the direct unintelligent task-solution based approach of, say, a word-processor. Software that intelligently sorts your e-mails, intelligently classifies your relationships, infers what information you are looking for, and generally observes and does what you do, are just over the horizon!



sumod_hajela@jasubhai.com



Sumod Hajela
Assistant Editor

“Building and maintaining relationships is a sustained effort that requires grace and empathy—precisely the quality that are hard to be captured by software”

PULSE

Bluetooth has finally arrived28
Vipul Shah talks about the past, present and future of Bluetooth

FEATURES

Robo Sapiens30
Robots aren't ready yet to take over the world, but they can carry your baggage...

Icons of Trust38
... is what the three-month survey threw up from the opinions of nearly 2000 consumers about their devices and the companies that manufactured them. Read on to find out who delivered the goods and who did not!

TEST DRIVE

Laps of Luxury56
21 devices vying for your precious lap

In Suite Pursuit82
Who says you have to have MS Office?

We tested five office suites to show you some other options that don't cost the earth

INSIGHT

It's Never Enough99
Learn how and where to store your data online

Beyond Wires102
Three wireless technologies—infra-red, Bluetooth and WiFi—explored and explained

Watch that Move108
Protect your laptop, and the data within from unfriendly hands and eyes

The Fax of the Matter112
The new fax machine doesn't need a phone, or you to stand by. It's your PC!

Tweaking the Kernel116
Rip the heart out of your Linux box, and then rebuild it. Learn how to chop, change, or update your Linux Kernel



▲ 38 The consumers have spoken. The brands are in. You've chosen the most reliable products and service providers



◀◀ 30
Before performing complete surgeries, a robot learns to heal itself



99 ▶▶
Storing data on the World Wide Web can save you a lot of trouble and hard disk space



▲ 56 12 brands send in their star performers to catch your eye



▲ 102 Welcome to the wire-free world. These technologies will set you free and help you attain a wireless nirvana

102

The 'hows' and 'how it works' of three wireless technologies

38

The Service and Reliability Survey speaks

56

Get yourself a laptop as the first gift of the year

108

Ways to secure your laptop from prying eyes...and hands

30

The evolution of the robot

99

Use the Net to share, store, transport and back up your data



123

Brush up on your photography skills

REGULARS

NEWS FEED14
 LETTERS24
 DROOLMAAL36
 BAZAAR92
 Q & A119
 TIPS & TRICKS ...123
 OFF THE SHELF ..136
 DIGIT DIARY137
 QUBIT138

To subscribe to Digit, fill out the subscription form available online at www.thinkdigit.com/subscribe

Reviewed this month

HARDWARE

- Bazaar** 92
- BenQ M550G
 - Epson Stylus C63
 - Handsprint A6 pocket printer
 - HP laserjet 1015
 - Kodak LS633 digicam
 - Logitech click plus
 - Monarch MV20
 - MSI GeForce FX5600 128 MB
 - Sony-Ericsson T610
 - Techcom Keyboard

Laptops 56

- Acer Tablet
- Acer TravelMate 290

- ACi Centrino
- ACi Emerald Pro
- ACi Ethos
- ACi Optima
- ACi Tablet
- ACi Ultima
- BPL DeskBook
- BPL Notebook
- Dell Inspiron 1100
- Fujitsu C series
- HP Compaq nx9005
- HP Compaq nx9000
- IBM T40
- Jaguar M270S
- PnP Ultra portable
- Toshiba Portege 3500

- Toshiba Portege M100
- Wipro Little Genius
- Zenith Centrino notebook

SOFTWARE

- Bazaar** 92
- AIST Movie DV suite 4.0
 - CompTax
 - Ulead Photo Impact XL

Office Compatibility 82

- Ability Office
- Corel WordPerfect 11
- Lotus SmartSuite 9.8
- OpenOffice.org 1.1.0
- StarOffice 7

ON THE CD



FREWARE

PHP 4.3.3

Develop complex Web applications easily
Dev Tools

DivX Bundle 5.1.1

Use the latest, and most popular way to view
and make movies
Essentials

BitTorrent 3.3

Download files via this upcoming P2P system
Internet

Mozilla Firebird 0.7

Use this promising feature-packed browser
to surf the Net
Internet

GAIM 0.72

Got accounts on Yahoo!, MSN, ICQ and
AOL? Chat through all at once with GAIM
Internet

Quotes 2002

Insert a unique quote in your mail every time
Office

AVG Antivirus Free Edition

Stay virus free
System

Digit Registry Tweaks

Check out our compilation of some registry
tweaks
System

MBM 5.3.5.1

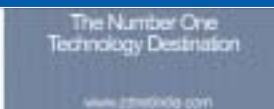
Monitor your motherboard and CPU for signs
of overheating
System

OpenOffice.org 1.1 for Linux

An alternative suite to tackle your office tasks
Office

Wine 20031118

Use your normal Windows applications on
Linux
System



KNOW YOUR CD

MINDWARE\SOFTWARE\ESSENTIALS

Every Windows installation requires software that help you better utilise your resources. These software can help view archives, electronic books, watch rich multimedia applications, or the latest movie trailers.

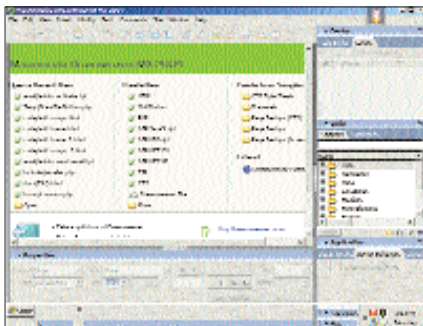
We have put together the Essentials category to help you get the most out of your PC and the Digit CDs. The section is constantly updated to reflect the latest out in the market, so do keep coming back here to ensure that your PC is well equipped.



MUST TRY SOFTWARE

Macromedia Dreamweaver MX 2004

Dreamweaver MX is a heavy duty HTML editor for making professional Web sites. From leading support for CSS-based design, to hand-coding features, Dreamweaver provides the tools



professionals need in an integrated, streamlined environment. This is a 30 days Trial.

Mozilla Firebird 0.7

Mozilla Firebird is based on Mozilla and created by a section of the Mozilla development team. It is a little lighter and provides fewer features. It uses a different interface design, and offers some handy features such as customisable toolbars, IE Favourites import,



integrated Web search bar and tabbed browsing. It also features source-view with syntax highlighting, password manager and more. Mozilla Firebird also includes a basic download manager that keeps track of your recent downloads, and shows which files are currently being downloaded

Sinbad: Legend of the Seven Seas

Play as Sinbad the sailor, and fight off monsters while aiming to get the Book of Peace from Eris, the Goddess of Chaos. Your objective will also be to save the life of Sinbad's good friend—Proteus—while fighting mystical creatures and beasts along the way. As support, you can get powers such as invisibility and can even summon an army of skeletons on your side.



www.thinkdigit.com



taste technology at www.thinkdigit.com

WEB SPECIAL



To Buy, Or Not To Buy
If only buying electronic toys was as easy as walking into a shop and choosing one. Even if they're available, the prices in India are liable to give you a cardiac infarct. Is there a way around this?

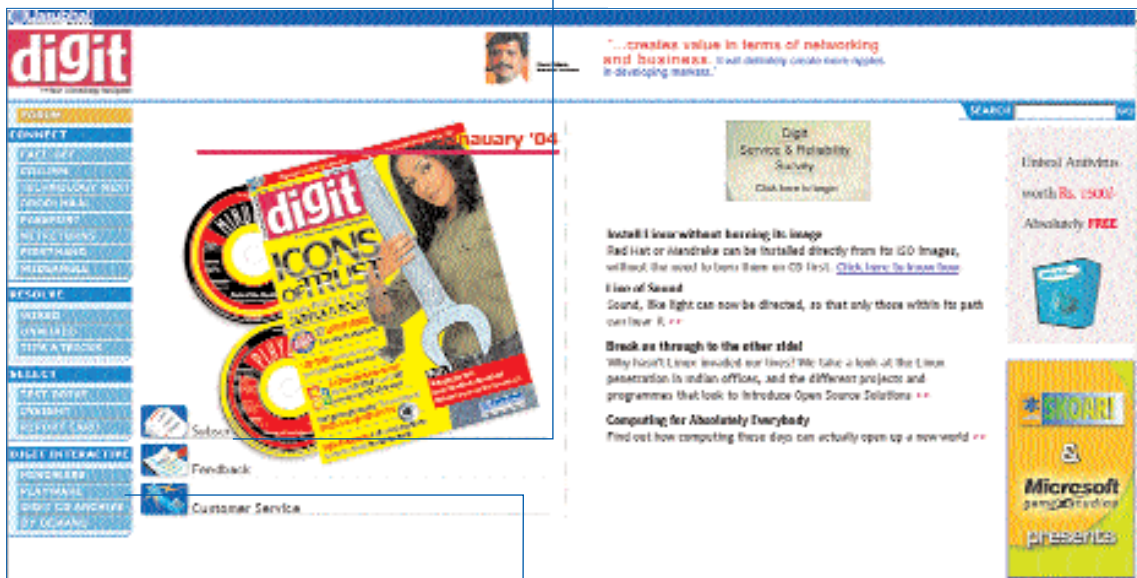
SUBSCRIBE

Subscribe now...



and get **UNISTAL Antivirus** worth Rs 1,500 absolutely **FREE!**

log on to www.thinkdigit.com/subscribe



BY DEMAND

You get to choose what goes on Digit Interactive. This month, you have chosen:



▶ **DreamRender 219**
Size: 8.82 MB
Mindware

▶ **Deus Ex 2: Invisible War**
Size: 223 MB
Playware

Expect these on the January 2004 CDs

WEB SPECIAL

Share your Windows

Find out how you can share your Windows XP system with others and give them the right privileges



FORUM

Want to brainstorm? Start a discussion? Share an idea? Log on to www.thinkdigit.com/forum

VOLUME 4, ISSUE 1

Chairman Jasu Shah
 Printer, Publisher and Editor
 Maulik Jasubhai
 Head - Publications & Web sites
 Louis D'Mello

Editorial

Assistant Editor Sumod Hajela
 Senior Writer Ahmed Shaikh
 Writers Srinivasan Ramakrishnan, Upendra
 Singhai, Niketu Shah, Mouly Arun-Prabhu
 Features Editor Sachin Kalbag
 Senior Copy Editor Mitali Parekh
 Copy Editors Robert Sovereign-Smith,
 Garfield D'Souza

Design

Art Director Marshall Mascarenhas
 Senior Designer Shivasankaran C. Pillai
 Designers Solomon Lewis, Sachin Dalvi,
 Mahesh Benkar, Atul Deshmukh, Parag Joshi
 Photographers Mexy Xavier, Jiten Gandhi

Test Centre

Head Hakimuddin K. Badshah
 Asst. Manager Deepak Dhingra
 Reviewers Sanket Naik, Praveen Kurup,
 Mustali Kachwala, Bhaskar Banik,
 Anil Gangolli
 Asst. Co-ordinator Gautami V. Chalke

Multimedia

Nilesh Vaidya, Pradeep D'Souza
 Content Co-ordinator: Saurabh Kumar

Media Studio

Afzal Mazgaonkar, Prasanth Uyyul

Production

GM Shivshankar Hiremath
 Managers Shiv Hiremath, Harish Suvarna
 Manager Operations Shailesh Iyer
 Executives Mangesh Salvi, Sriram Iyer

Pre-press

Prashant Nair, Ravindra Dighe

Circulation & Logistics

Adarsh Kaul, Nicholas Kiro

Customer Service

Reema Sadarangani, Vanita Narang,
 Arpita Ganguli

Marketing & Sales

Brand Manager Prashant Narekuli
 Deputy Head - Sales Vijay Adhikari
 Marketing Manager Bhavesh Thakor
 Manager - Consumer Mktg
 Nabjeet Ganguli
 Consumer Mktg Vinith Shetty,
 Noopur Nigam, Narayan Ramachandran,
 Mohan Raju, Mitul Sanghavi
 Marketing & Communication
 Ashwin Boricha, Vijay Padaya, Mona Talati,
 Kaizad Vajifdar, Siddhart Singh

Head Office: Editorial, Marketing & Customer Service

Plot No D-222/2, TTC Industrial Area,
 MIDC, Shirvane, Nerul,
 Navi Mumbai 400 706
 Phone: +91 022-27629191/9200
 Fax: +91 022-27629164

Printed and published by Maulik
 Jasubhai on behalf of Jasubhai Digital
 Media Pvt Ltd, 26 Maker Chambers VI,
 2nd Floor, Nariman Point,
 Mumbai 400 021, India.
 Editor: Maulik Jasubhai
 Printed at Magna Graphics (I) Ltd.,
 101 C & D Govt. Ind. Estate, Kandivli,
 Mumbai 400 067

Cover Design Ashwin Boricha
 Photographer Umesh Aher
 Model Indu Verma



Write Back

Got feedback on Digit or www.thinkdigit.com?
 Have something to say about an article we
 published?
 We'd love to hear from you. Send us your
 rants and raves at

readersletters@jasubhai.com

Product Testing

Want your product reviewed by Digit?

Contact our Test Centre at

testcentre@jasubhai.com



Software on CD

To submit and suggest software for inclusion
 in the Digit Interactive CDs, contact us at

cdcontent@jasubhai.com

Help!

Complain about your missing copy?

Cover CD not working properly?

Renew your subscription

Report a change in mailing address

Order a back issue. Need assistance on any of these?

Contact Customer Service at

help@jasubhai.com

Tel: 022-27629200/9211 Extn: 1013/1016

Fax: 022-27629274



Endorsements/Reprints

The Best Performance and Best Value Awards
 are the undisputed stamp of excellence for
 technology products in India. If you are a win-

ner and are interested in ordering article reprints or using our
 logos, contact

mitul_sanghavi@jasubhai.com

To Advertise

CONTACT OUR BRANCH OFFICES

BANGALORE Bibhor Srivastava E-mail: bibhor_srivastava@jasubhai.com Phone: 5325670/88, 2899287, 37629285	E-mail: jayanta_bhattacharyya@jasubhai.com Phone: 22345100/5200,	Phone: 51608658/59, 32358374
CHENNAI Sahayaraj Prabhu E-mail: prabhu_sahayaraj@jasubhai.com Phone: 28235186/89, 33629282	MUMBAI Rupesh Sreedharan E-mail: rupesh_sreedharan@jasubhai.com Phone: 56310515/14, 33629268	PUNE Vinayak Inamdar E-mail: vinayak_inamdar@jasubhai.com Phone: 24482059, 24494572, 33629280
KOLKATA Jayanta Bhattacharyya	NEW DELHI Arvind Prabhakar E-mail: arvind_prabhakar@jasubhai.com	SECUNDERABAD Vinayak Inamdar E-mail: vinayak_inamdar@jasubhai.com Phone: 55221051, 27894167, 3362980

ADVERTISERS' INDEX

CLIENT	PAGE
ACI	.17
Autocar	.51, 61
Automagazine	.33
ceBIT	.11
Dell	.12, 13
Globus	.15
IBM	.7
IIT Powai	.29
JS Equipment	.71
Microsoft	.9
Monarch	inside back cover
mosar baer	inside front cover
Nikon	Back cover
Penram	.67
Sadguru, Turn On Systems	.79
Western Digital	.33
World Wide CD ROM	.73
Zenith	.19

Digit Promise to our readers

While every effort is made to ensure that the information and prices provided are correct, there may be some variation due to differences in local taxes across states. Please keep this in mind before buying any product.

news feed

DIGIT JANUARY 2004

hypothesis

CME

■ What is CME?

Core Management System (CME) is being developed by American BIOS manufacturer Phoenix. It aims to supplement their new BIOS versions, and work hand in hand with Windows to make computing more secure, using Core System Software.

■ How does it work?

It works with Windows Longhorn, which blends software and hardware-based Digital Rights Management via the Next Generation Secure Computing Base (NGSCB). Additionally, Device-Net-worked Architecture (d-NA) is exposed to the developers to better utilise the resources of the new system.

■ What does it do?

CME has a cryptographic engine and a service provider at the hardware level, thus providing a tamper-proof location for secure services and secure applications to function. Functions such as seeking an authorised hardware device to transfer a file should be relatively reliable.

snapshot

168 million PC units expected to ship in 2004, translating to a **14 per cent** growth of the market

Source: Gartner

Segway to become battlefield bot

Researchers are working to modify the Segway Human Transporter into a battlefield robot, which can be used for transporting injured soldiers to safety, or for following soldiers while carrying equipment for them. The modified transporters will be good alternatives to the four-wheeled robotic vehicles currently in use, because they

have a high centre of gravity, allowing cameras and sensors to be placed several feet above the ground. DARPA has invested \$26 million on this project, in the last year alone. At the Carnegie-Mellon University, Segway robots have been developed that can move and kick soccer balls. Researchers at the University of Southern California are working on a Seg-

way Robot that can follow humans and carry up to 50 kg of gear for them.

When Transporters were launched in 2001, Segway was expecting sales in millions. So far, however, they have only been in the thousands. Segway is therefore welcoming this initiative, as it would help increase sales and lower prices.

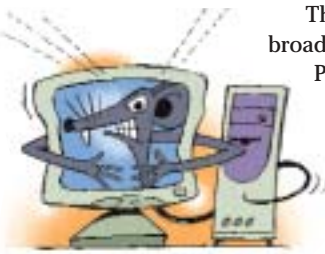
A RAT in your PC

According to a recent report by Sophos, an anti-virus and anti-spam company, almost 30 per cent of spam being circulated is relayed by PCs infected with Remote Access Trojans (RATs). A RAT is a Trojan horse that gives full control of the PC to the attacker,

allowing him or her to send e-mails with that user's name. Further, the attackers remove all traces of their activities from the PCs.

The main targets are broadband users whose PCs aren't secured properly.

The report also states that the purpose of making viruses is changing from creating chaos to getting financial rewards.



ILLUSTRATOR: Mahesh Benkar

Reprintable paper

The paperless office may be a long way away, but Toshiba has developed an ink that can be used with ball pens or laser printers, and can be erased by passing through an erasing machine, that can erase 200 pages in two hours. The ink is made up of three different chemicals—two mix to give the ink its colour, while the third reverses the process at

the time of erasing, causing the ink to become invisible. It owes its name—E-blue—to its colour.

According to Toshiba, paper makes up 40 per cent of the office waste in Japan. E-blue will help cut office waste and recycle paper. The entire setup, including the toner and the erasing machine, is priced at ¥300,00 (around Rs 1,26,000).

A Linux-based Tablet PC

A company called Element Computers (www.elementcomputer.com) has just launched the world's first sub-\$1000 tablet PC, named Helium 2100. The PC runs the Desktop/LX Tablet Edition OS from Lycoris. It has a VIA 1GHz Antaur processor, a 30 GB hard drive, 256 MB of RAM, and a 14.1-inch XGA screen. The PC features basic touch-screen functions, but handwriting recognition is still under development; it may be released next year as a software upgrade.

According to Element, the low cost of this tablet PC has been made possible because Windows is not pre-installed, thanks to its 'No Windows' policy, and offers laptops with the Desktop/LX operating system for as low as \$799 (around Rs 35,955). Element also offers pre-tested hardware through its online store.

The flip side

To counter file-sharing pirates, record labels have been bundling bonus DVDs with audio



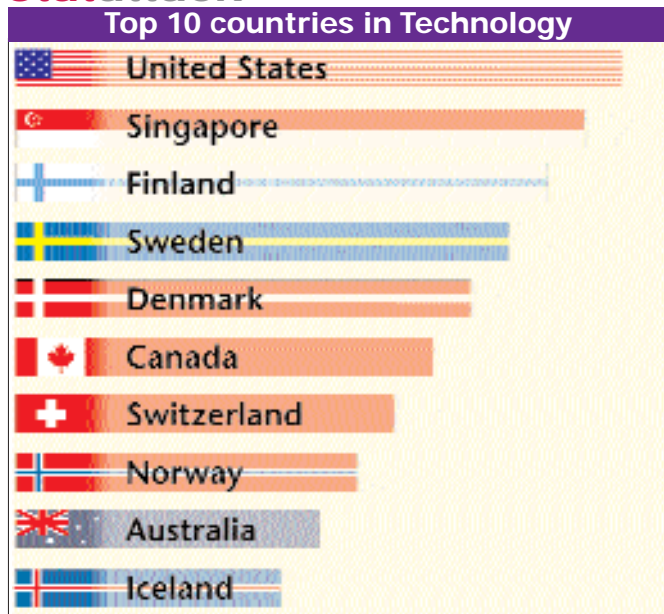
CDs. The bundled DVDs come with documentary footage and concert videos, and are sold as a package at the price of the regular CD.

All that might soon change if OneDisc Technologies from Dallas convinces the big names in the music industry about

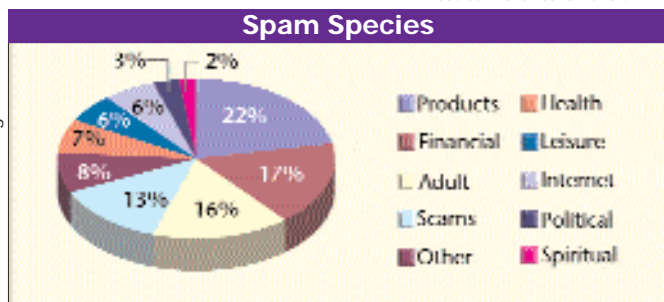
their new combination disk. This disk plays a DVD video on one side, and a CD audio on the other. It's been designed to play on all existing players. The first such disk, *Kathleen Edwards' 'Live From the Bowery Ballroom'* is already out in the US.

The disc is 0.28mm thicker than a normal DVD disc. Using such a disc will result in reduction of production cost. The patent for this technology currently belongs to a German company named DVD Plus International. Based on this technology, more than 70 titles have been released outside the US.

statattack



Source: World Economic Forum



Source: Brightmail Inc

DDR's second take

US memory firm Micron began production of DDR2 memory modules from December 2003. The memory chips on the modules are being manufactured in densities of 256 Mbit, 512 Mbit and 1 Gbit, and should come with capacities of 128 MB to 4 GB. Micron will be shipping this in volume later this year.

Intel's upcoming 'Grantsdale' chipset will use the new DDR2 memory—this means DDR2 memory availability will be crucial for its new microprocessor and chipsets range.

Incidentally, to shore up its bets on the availability of memory, Intel has made investments in Micron, as well as Japanese memory company Elpida.

Equal outgoing rates

The Telephone Regulatory Authority of India (TRAI) plans to pass an order that forces mobile operators to provide equal rates for outgoing calls to any network. Most operators provide a lower outgoing call rate for the local network. This will soon be passé. Under the unified license regime, all telephone operators can choose between three licenses: fixed, limited and full mobility. Once a mobility operator fixes the rate for outgoing calls, the same would be maintained for all full mobility networks. The rule will be applicable to fixed and limited mobility operators also. This allows you to choose any network, irrespective of your existing service provider. Such a rule is bound to increase competition between service providers.

redalert

IE address spoof

A vulnerability in Internet Explorer can be exploited to display fake URLs in the address and status bars. This can be used by others to fool a user into disclosing confidential information such as credit card numbers. Secunia discovered this vulnerability, and you can see a demonstration of it at http://www.secunia.com/internet_explorer_address_bar_spoofing_test/. Even though there are about 20 known vulnerabilities in its products, Microsoft did not release any patches in December—it will stick by its decision to only release monthly patches and updates.

Unsafe Yahoo! Messenger

A vulnerability in Yahoo! Messenger allows a hacker to launch XSS (Cross-Site Scripting) attacks. XSS occurs when a Web application gathers malicious data from users when they click on a link in a browser or chat window. This link contains the malicious content, usually encoded in hexadecimal code. The hacker executes malicious code through a Web page that is loaded through a 'ymsgr:' Web address. This vulnerability has been corrected in the latest version of Yahoo! Messenger—5.6 build 1356.

snapshot

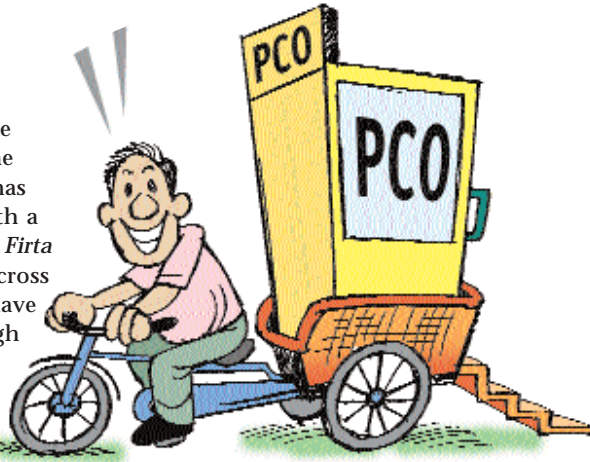
World-wide sales of mobile phones touched **132.8 million**, in the third quarter of **2003**

Source: Gartner

Pedalin' PCO

If people don't come to a mobile phone, take the mobile phone to the people! Jaipur-based Shyam Telecom has equipped a fleet of cycle-rickshaws with a mobile phone each. Called the *Chalta Firta PCO*, the rickshaw drivers pedal all across Jaipur, freely choosing their beat and have started making a decent income through their commission on this mobile pay-phone service. Shyam Telecom outfits the rickshaws with handsets for free, and derives income through the increased traffic on their network.

This is just the beginning; Shyam Telecom plans to broaden the mobile-to-mobile pay-phone service into mobile-a-cyber-cafe by adding Internet-ready laptops. And finally, get



ready for this one: they're running a pilot test to get camels on the Net, or rather, under it. Shyam Telecom currently has two camels roaming the deserts with wireless computers in tow, offering Internet connections to all!

An Ace(r) of a Ferrari

Anything fast has to be a Ferrari. Acer India has launched a limited edition of the Ferrari 3000 notebook. With a price tag of around Rs. 1.6 lakhs, the laptop was launched to celebrate Ferrari's Grand Prix world championship victory last year. It's



powered by an AMD Athlon XP-M 2500+, 512 MB of DDR SDRAM, a 60 GB hard drive, a DVD-Writer and a 15-inch screen backed by a 128 MB ATI Radeon graphics card. Communications is handled via an integrated 802.11g wireless LAN, Bluetooth, 10/100 Mbps Ethernet, and a 56 Kbps modem. It also has a multi-format four-in-one memory card reader, 4 USB 2.0 ports, an IEEE 1394 port and S-video port. Weighing 2.9 kg, it has a mileage of 3 hours.

Windows-powered cars

Microsoft has set its eyes on the car market, and it wants in-car electronics to run its Windows Automotive platform. With 50 million cars rolling out of assembly lines every year, Microsoft has sensed a huge market for its products. "We'd like to have one of our operating systems in every car. It's a lofty goal," says Dick Brass, vice president of Microsoft's Automotive Business Unit. The Windows Automotive platform

will have features such as hands-free communication, support for wireless standards such as GPRS, CDMA, WiFi, driver distraction control and entertainment services.

Microsoft is encouraging car manufactures to use Windows CE to run navigation systems, entertainment systems, etc. Not only have premier car manufacturers—BMW, Honda and Volvo—shown interest, but 23 car models are currently using it. Modern cars are increasingly relying on computers to perform sophisticated functions such as GPS navigation and entertainment functions. Citroën's C5, for example, uses Windows-powered software to provide turn-by-turn navigation capabilities, hands-free cellular phone control, wireless synchronization of data with mobile devices, etc. Similarly, the BMW 7 series has a Windows-powered navigation application as a part of the new cabin design, iDrive.

Microsoft is not alone in

snapshot

At the end of **November 2003**, India had **20.73 million GSM** and **5.87 million CDMA** subscribers

Source: TRAI

heroes

Notebook sales Laptop sales in India may finally rise. Notebook manufacturers are aggressively reducing the prices to grab market share, with almost all the laptop companies pegging the entry level price at around Rs 55,000.

Indian R&D India is poised to become a global research and development hub. Google has set up a Research and Development lab at Bangalore. Intel already has one here to develop the next generation of mobile chipsets and server processors.

zeroes

Parts shortage The demand of mobile phones world-wide has outstripped its supply. One reason is that there is a shortage of colour screens and cameras. Also, flash memory, used in removable storage devices such as USB sticks, is in short supply.

Windows 98 Officially, Windows 98 died on December 15, 2003, and will not be available through Microsoft's channels. Distribution of SQL server 7 and some Office 2000 related tools has also been halted.

The move is due to the agreement between Microsoft and Sun over the distribution of Java virtual machine.

this niche market, and faces competition from embedded software developers—Wind Systems, QNX software and, not to forget, embedded versions of Linux. Some of these companies' products are used in F1 cars. →

PC discrimination

The 'master/slave' convention used by the computer industry has come under fire from Los Angeles county officials. Officials have asked computer vendors to remove the offensive reference. "Based on the cultural diversity and sen-



sitivity of Los Angeles county, this is not an acceptable identification label," LA County's Division Manager Joe Sandoval said. He added that it's only a request. "I do understand that this term has been an industry standard for years, and this is nothing more than a plea to vendors to see what they can do," he added.

The Director of the Office of Affirmative Action, Dennis Tafoya, said that a search has been launched to identify and replace such offensive labels. Sandoval rejected suggestions that products using the terms 'master' and 'slave' should be banned.

snapshot

Toshiba manufactures world's smallest hard disk that is **22 mm** in diameter and has a capacity of **2 to 3 GB**

Source: Asia Times

The new face of Japan

In what can only be called true e-governance, Japan has appointed a computer-generated lady as its goodwill ambassador to the ASEAN countries. The ambassador has been named Sakura Sanae; Sakura means Cherry Blossoms, and Sanae is an anagram for ASEAN. Instead of creating a stereotyped, stern-faced ambassador, "she is 21 years old, born in 2003 from a PC," says the official statement on the Japanese foreign ministry Web site.

2003 has been designated Japan-ASEAN exchange year. Given the diversity of the ten ASEAN countries, it is difficult to get a goodwill ambassador who understands all the languages, and can cope with the diversity. Japan, to keep up its tech-savvy image,



has created a computer generated ambassador who can visit all ten nations at the same time. Visit www.mofa.go.jp/region/asia-paci/asean/year2003/cg2.html for images of the latest Japanese ambassador.

Itanium2 available as 'Trialware'

"Somebody please buy Itanium", Intel seems to be saying. The company has started a programme named 'Intel Itanium 2 Solution Challenge', under which it offers the Itanium 2 for a trial period of 90 days. Global 500 companies using systems based on Reduced Instruction Set Computing (RISC) can avail of this offer. Intel hopes this will allow the companies to experience its Itanium2 platform, and realise its advantages. "We're bullish on the Itanium2 processor's performance and price advantage versus proprietary offerings," says Lisa

Graff, director of Intel's Itanium Group. Intel claims that out of the top 25 Global 500 companies, 14 have deployed Itanium2 servers under this scheme. The scheme will run until the summer of next year, and Intel is working with vendors and software providers for this program to succeed.

Although the sales of the Itanium are rising, they aren't showing the growth Intel expected from it—Intel, ambitiously, named *circa* 2003 as the year of the Itanium. The company aimed at selling 100,000 Itanium processors this year, but sales

Spam

Yahoo! v/s Spam

In April 2003, Yahoo! formed an anti-spam alliance with America Online and Microsoft. Now, it's working on DomainKeys—a code that uses public key cryptography to digitally sign the outgoing messages. It will be compatible with two most popular e-mail programs—Sendmail and qmail. According to Yahoo!, most e-mail users are losing trust in e-mail because of spam, and almost half of the messages that it handles are spam. Using sender authentication, Yahoo! expects to regain its credibility, eventually opening paths to more intelligent spam blocking technologies.

Anti anti-spam virus

A virus is using a new trick to launch DDoS attacks against anti-spam Web sites. Called MiMail.L, it spreads through e-mail as a compressed attachment that dodges anti-virus software. It then sends itself to all addresses on the infected computers, and uses these systems to send meaningless traffic to Web sites of anti-spam groups, including Spamhaus, SPEWS and Spamcop that maintain a list of spam-servers, thus helping users to identify spam.

speak otherwise. An IDC report quotes that 4,957 systems based on the Itanium processor were sold in the third quarter of 2003, compared to 10,746 Opteron servers and 24,000 SUN UltraSPARC servers sold.



MagiQal Encryption

Aiming at weeding out the weakest link in the chain of encryption, a company called MagiQ Technologies Inc., claims to have developed an unbreakable and unbreachable encryption system, named Navajo. The Navajo black box system costs about \$100,000 (Rs 4,55,100), and can span 70 miles, after which additional relay boxes are needed. The system comprises 19-inch boxes which communicate with each other over optical lines.

Navajo is secure because it uses Quantum encryption. The keys are transmitted using photons, which are discrete particles of energy, and they change 10 times a second. This means if a person gets hold of the key, it will be rendered useless almost immediately. Also, based on Heisenberg's Uncertainty Principle, the extremely sensitive photons change their behaviour if somebody tries to spy on the communication during the transfer.

Up until now, people have only been using bigger and bigger encryption keys generated by more and more complex algorithms, which means that breaking them was just a question of 'when'. Quantum cryptography changes all that.

snapshot

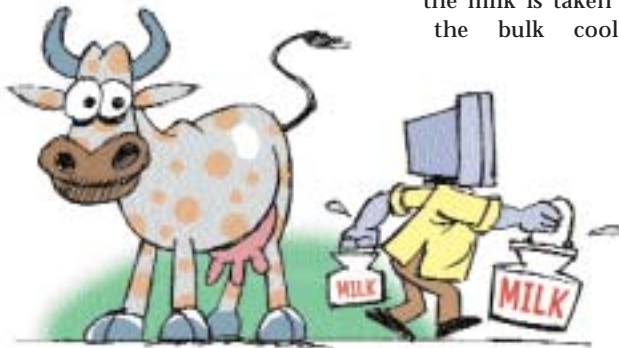
Largest prime number with **63,20,430** decimals calculated using **2,00,000** computers

Source: Great Internet Mersenne Prime Search

Analysing milk, PC-style!

In Baramati, Maharashtra, the life of dairy-farmers has changed in recent times. Earlier, cow owners had to milk cows and rush to the local market to sell the milk before it got sour. At times, almost 50

Cows are milked by a machine, and the milk is taken to the bulk coolers. The fat content of the milk is checked by a computer, and the price accordingly determined. The dairy farmer is paid immediately, and the milk is taken to the bulk cooler.



per cent would be left unsold. However, with the efforts of Dynamix Technologies, which sells milk to Nestlé and Britannia, things have changed. It has set up computerised and refrigerated milk collection centres, locally known as bulk coolers.

Later, it is transported to the Dynamix factory.

Computers are also used to maintain a database of the complete history of health, nutrition, disease, pregnancy etc of a cow. This helps dairy farmers develop better breeds that produce more milk.

tomorrow's technology

Chip off its size!

Two recent technological advances will allow shrinking of chips to continue for some time. NEC announced it has developed the world's smallest transistor that is 1/18th the size of existing transistors. Using the new technology, a chip measuring 1 sq. cm will be able to hold 40 billion transistors—about 150 times more than the current density. Such transistors can be used to build a supercomputer that churns out 600 billion operations a second, while

being the size of an ordinary desktop.

The company expects to start production by 2020.

In a separate development, IBM announced it uses molecular self assembly to build smaller chips. Organic polymer molecules assemble themselves into hexagonal patterns that are denser and more precise than those obtained using lithography. The process can be implemented using existing manufacturing tools, making it inexpensive.

quoteworthy

Everyone's going to be talking about the digital divide, and how massive it is. Is the digital divide as big as we think? The answer is, 'No!'

Michael Minges, co-author of the annual study by the International Telecommunication Union

US society is not being re-skilled and re-tooled to stay on the top of the emerging environment

Wipro Chairman, Azim Premji, on why IT firms find India attractive

They are winning by a considerable margin. Very few have been identified, prosecuted or punished

David Finn, Director of digital integrity, Microsoft, commenting about pirates in South-east Asia who seem to be winning the war on piracy

It's a dirty secret. Floating-point arithmetic is wrong. It only takes two operations to see that computers make mistakes with fractions.

John Gustafson, an investigator with Sun Microsystems, Santa Clara, California, on bad mathematical calculations being the reason behind system crashes. He reckons Microsoft need not always be the culprit

December dilemma

I had renewed my Digit subscription last month (for June 2004-May 2005), but I want to cancel it. This is mainly because I feel cheated by your subscription offer.

The encyclopaedia CD was the sole reason I subscribed in advance, but to my utter dismay I found it free with my December issue. I feel cheated by Digit.

Joydeep Chakraborty

Via e-mail

Whoopee! Who said you can't have everything? Four CDs of super-good software + an Encyclopedia CD + one hell of a movie + one hell of a special issue for just Rs 100 extra!! You guys should be guest lecturers at management institutes on "The Perfect Offer". Congrats!

V.Dev Kanchen

Via e-mail

The December 2003 issue of Digit with the VCD is S-U-P-E-R-B. My Entire family enjoyed watching *Ice Age*. Do keep sending more and more VCDs with each Digit issue.

B. Lalith Kataria

Via e-mail

I have just received my subscription copy of Digit Dec 2003. Disappointingly, all the four CDs labelled 'Softwarez@Max' are the exact copy of the CDs provided in the 10-CD Pack. Even the Tips & Tricks Section in the Encyclopedia CD was previously provided as a separate CD. So the only thing worth giving is ICE AGE and the Encyclopedia which does not contain even a single audio or video clip. I'd feel totally cheated if I bought this issue at a cost of Rs 200.

Sumeet Malhotra

Via e-mail

Of laptops and time travel

I have a few things to point out: When you test a product, please specify three to five vendors that sell it; this will save us from visiting several vendors just to see whether they have that particular model. I would also like to see a test on laptops, as laptop prices are falling.

Now for a few goof ups: The quiz on page 184 states that the answers are on page 71, but they aren't. On page 50: CPUs 2003 Digit winner: Pentium 4 3.2 GHz, Previous winner 2001: Intel Pentium 4.2 GHz. Intel achieved a speed of 4.2 GHz in 2001. I didn't know that!

Sridhar

Via e-mail

Our aim was to delight newsstand buyers with a package worth much more than the cover price of Rs 200, but their enthusiasm seems to have a counterpoint in the protests of some of our new subscribers.

While the response to our Software-for-a-Lifetime offer drew a tremendous response, the number is, but a small fraction of our readership. We offered our periodic readers only a small sample of the massive CD-Pack that was free with the subscriptions. Four CDs do not compare to a 10-CD pack, one that contains not only 7 CDs worth of applications and games, but also the only free 3-CD distribution of Red Hat Linux.

Similarly, while the Encyclopaedia was bundled with the December issue, we offered our subscribers who signed up for the free Encyclopaedia offer, an extension to their subscription to compensate for the lost exclusivity.

If you signed up for these two subscription schemes, and feel you did not get a fair deal, please do not hesitate in asking for an immediate full refund of the subscription order.

Secrets revealed!

I am a regular Digit reader, and greatly appreciate the magazine, but this time, I'm really angry! Your December 2003 issue revealed some registry secrets, which I had mastered after a lot of hard work and man-hours. Thanks to you, everyone can master these secrets. I don't feel special anymore, and for this, I can't forgive you. Keep up the good work!

Amit

Via e-mail



ILLUSTRATOR: Mahesh Benkar

Dear Sridhar

Let's all join hands and concentrate... Poof! There you go. The issue you have in your hands now contains a rather large test on laptops. Magical, aren't we?

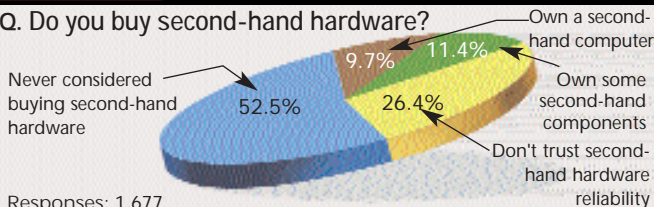
Thank you for pointing out the goof ups. In preparation for the December 2003 issue, we were all involved in advanced mind-games that required mnemonic and spatial skills... As a result, we inadvertently caused an anomaly in the space-time continuum, which created a big time portal. The gravity of all the goodies packed into the December issue yanked the 4.2 GHz CPU out of the future, and onto page 50. Of course, in keeping with the First Law of Thermo-dynamics that states that the energy of the universe is constant, we had to send Qubit answers through the time portal to close it. Honest!

If you still haven't solved Qubit, look for the answers on the Digit forum.

Registry hacks are truly an art form. Their knowledge is well sought after, and their execution requires guts of steel—don't forget to backup your registry—which is why we feel your pain. In the near future, we will reveal '15 Secrets to Life', and hope that the saints and sadhus won't mind too much. Stay tuned!

digit READERPOLLS

Q. Do you buy second-hand hardware?



Responses: 1,677

Your vote counts

This month's question:

Which is the means of communication you use the most?


- Telephone
- Cell Phone
- E-mail/ Instant Messenger
- Indian Postal Service

Log on to www.thinkdigit.com and vote

Setting trends, Digit style

Needless to say, Digit has always been a trendsetter. Dishing out a free VCD with the December 2003 issue irrevocably supports that envious fact. The Digit Encyclopedia, the VCD and the four software CDs in one issue—it seemed as if I had hit the jackpot! Kudos to the entire Digit team for such a creative effort! However, I do wish to address a few issues: Firstly, Digit being a technological magazine, an old sci-fi flick such as *Blade Runner* would have been more appreciated than *Ice Age*. Secondly, keeping aside the VCD and the Encyclopedia, the other four CDs could have easily been squeezed onto a DVD with the price tag for two CDs, and the one DVD could have been set at Rs 100. I found the price too expensive. I hope to see sci-fi movie VCDs in the future from the Digit think-tank!

Arindam Sarkar, IIT, Kharagpur
Via e-mail

Thanks for writing to us  Arindam,

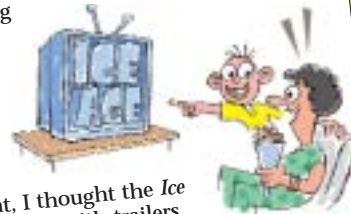
Firstly, DVD-drives are still a rarity in India, as attested by the reader feedback we got from the August 2003 Linux special. We wanted all our readers to enjoy the December package, hence the choice of CDs.

We briefly considered a science fiction movie, but decided on a broader interest movie, *Ice Age*, that everyone can enjoy, as attested by fellow reader Neha Prabhu.

A bundle of joy

It was the sixth of December, and I was impatient for my subscription copy of Digit. Come noon, the door bell rang and voila! One cool-looking guy with my subscription issue, I was very happy. I came to my room and opened the cover. To my astonishment, I found six CDs in it! Wow, you provide your magazine with a lot of punch. For a moment, I thought the *Ice Age* VCD was a promotional CD, with trailers or advertisements, sponsored by Twentieth Century Fox. I bravely put the CD in my VCD player, and to my excitement, it was *Ice Age*, the entire movie! Fantabulous! My four-year old son and I thoroughly enjoyed the movie that day. Congratulations! Keep it up. This idea of yours is really innovative. All the Best.


Neha Prabhu
Via e-mail



The ratings game

In the November 2003 issue of Digit, although the Zenith PC was graded 'B-', it still won as the best performer. Why was this so?

Jishnu R
Via e-mail

The Zenith PC won  because it was the best performer. It beat just about everything else, in almost every test. However, our ratings (A, A-, B+, B, B-, etc.) also take into consideration the Value For Money (VFM) scores. We calculate this score by adding its performance and features scores, and dividing the sum by its price. This decimal value is then fed into a calculator that determines a product's VFM.

Complicated? Sure, but this is the best way to make an accurate judgment. The Zenith PC beat all the others, but cost a whole lot more too. Was this increase in cost justified by a significant increase in performance? We rate products, and have two categories—Value Winners and Performance Winners—so that you can make an informed decision to buy the products that best suit your needs, as well as your pockets.

From the Forum (www.thinkdigit.com/forum)

lost_in_the_discussions
Analogue Novice
Digitized!
Joined:
10 Dec 2003
Posts: 8

Posted: Wed Dec 10, 2003 2:39 pm Post subject: Ads, ads and ads!!

At first sight, there was one thing that irritated me in the December issue of Digit—the ads. Since I am doing my Business Management course, let me tell you something from the Business point of view. Digit is a business establishment which exists to make money. And when you talk about the business model of any media, be it newspapers, be it magazines or even television programs, they survive and run because of advertisements.

super_ferrari
Resident Techie
Joined:
05 Dec 2003
Posts: 89

Yeah ads are necessary for a business organization's existence....even our super rich master blaster Sachin does so many ads...does he need dem?!... But using models on da cover page of Digit makes it look like some Bollywood mag rather dan technology mag. Overall I am satisfied with DIGIT...a really informative mag.

lost_in_the_discussions
Analogue Novice
Joined:
10 Dec 2003
Posts: 8

If you see other technology magazines, all they have on their cover page is some boring graphics, or at most, some computer component. I think these cover models give Digit a different look. And don't tell me that you don't like nice girls!!

Goof Ups

- E.S.Chandrasekaran of BSNL has pointed out some factual errors in Insight on Virtual Private Networking: BSNL offers two types of VPN services for data communication—MPLS-VPN and IP-VPN. It also offers IP-VPN services through BSNL's Internet nodes located throughout the country.
- The price of the Sony SDM N80 18-inch LCD is 1,27,000, and not 1,29,000. Whew, aren't you glad

Notice any goof-ups?
Write to goof@jasubhai.com

E-mail: readersletters@jasubhai.com

Send your letters marked 'Readers Letters' to the Digit office:

D-222/2, Om Sagar Building, MIDC, TTC Industrial Estate, Nerul, Navi Mumbai 400 706

Phone: 022-2762 9191/9200 Fax: 022-2762 9224



VIPUL SHAH

// Already, 100 million Bluetooth devices have been shipped //

Bluetooth has finally arrived...

Bluetooth, a short-range wireless technology was unveiled in 1998. It was named after the Danish king Harald Bluetooth, who is reported to have united Denmark and Norway. He was also supposed to unite the world of consumer electronics and computers, and make all the devices in the living room, as well as the office, talk to each other. Bluetooth is widely promoted as a 'cable replacement' solution which works within 10m to 100m at 720 Kbps. But we didn't see much happening in 2001 and 2002 in this direction. The reasons are various: from Microsoft not including Bluetooth in Windows XP and its SP1, to companies trying to push customised Bluetooth devices which won't see and communicate with Bluetooth devices made by other companies. Also, a lot of other technologies such as cordless phones, Wi-Fi and microwave ovens share the same 2.4 GHz band, and hamper the performance of Bluetooth devices that are in their vicinity. Meanwhile, a lot of marketing muscle was deployed to the competing Wi-Fi standard. During this period, Ericsson—the inventor of Bluetooth—kept releasing Bluetooth-capable mobile phones under its new corporate brand Sony Ericsson. We also saw the occasional release of a Bluetooth-capable PDA from Palm, the Clie from Sony and the iPAQ from HP. But all these catered to the high-end segments, and were not really meant for the budget-conscious employee or home user.

All of this changed slowly this year. We saw a flurry of Bluetooth products announced in the last 4 months by HP, Lexus, Nextlink, Plantronics, Jabra, Sony-Ericsson, Siemens, Nokia, Palm, Microsoft, Logitech and Sony. Lexus announced a Bluetooth-integrated car which will pair with four different Bluetooth mobiles, and let you use all the mobile functionality from the dashboard and steering wheel, while your phone sits in your bag. It will allow you to dial only selected numbers from the address book while car is in motion, and all the numbers when the car is stationary. Nokia announced a Bluetooth car kit for those of us who can't buy a Lexus.

Microsoft and Logitech have a keyboard and optical mouse that will use a Bluetooth

USB dongle on the back of a PC. HP now uses Bluetooth as a standard on most of its Windows Mobile 2003-run iPAQ PDAs, but Wi-Fi is offered only on its top-of-the-line 5500 series. Tapwave released the Zodiac gaming device based on PalmOS, which uses Bluetooth. Philips introduced the world's cheapest Bluetooth-enabled GPRS colour phone—the Fisiso 826—at Rs 7,500 in India last month, and it was sold out in matter of days.

My Bluetooth phone synchronizes the address book, calendar, etc, with my PC, which is in the next room. The best part is that Bluetooth is driver independent—I don't need drivers for every Bluetooth device talking to my Windows XP PC. So, when I recently bought a Siemens S55 phone, I didn't need to install a CD containing the drivers and software, as my Bluetooth-enabled PC was more than ready to talk and synchronize with any Bluetooth phone.

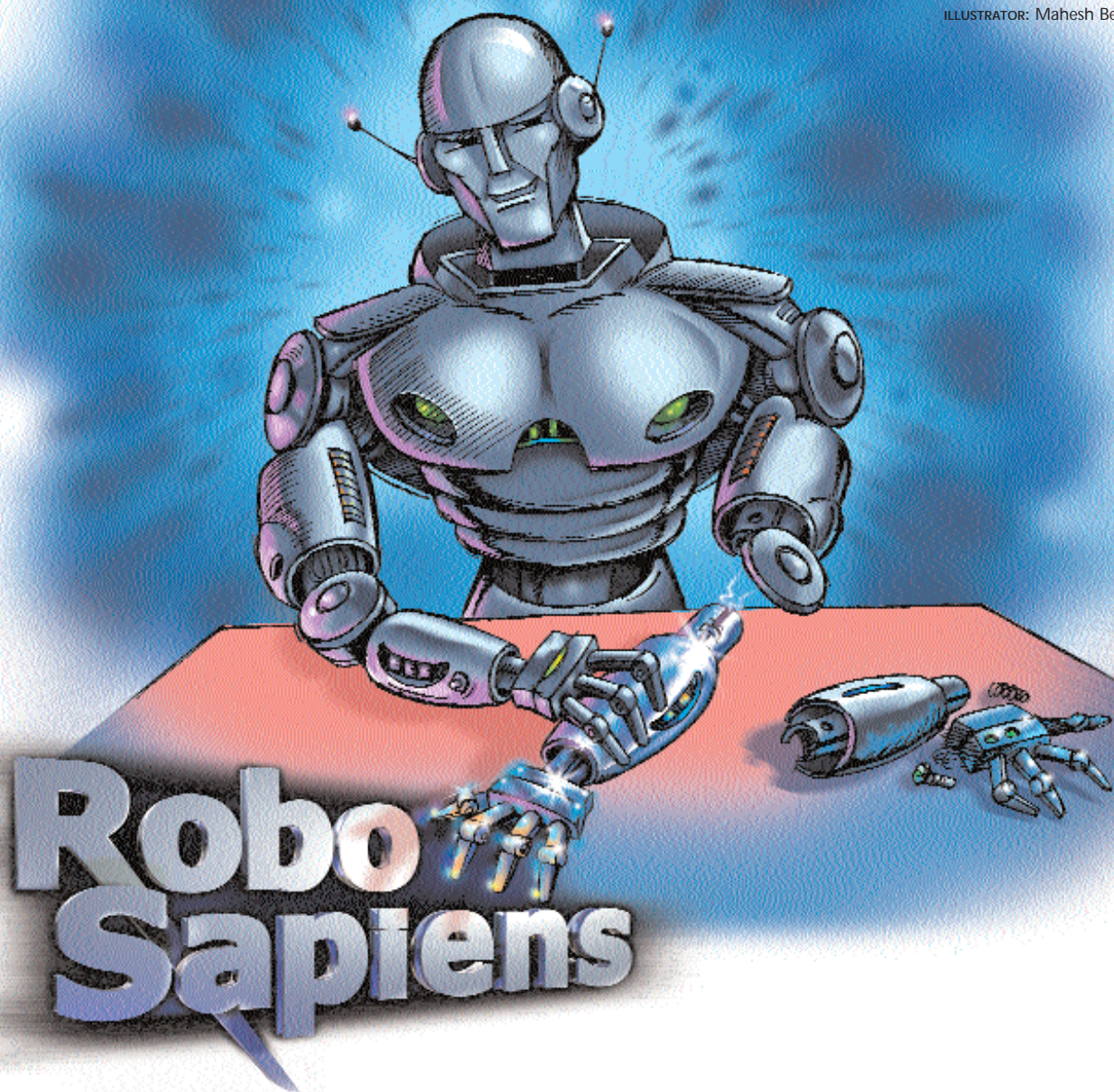
Since October 2003, more than 1 million Bluetooth devices are being shipped every week, all around the world. Already, 100 million Bluetooth devices have been shipped.

Bluetooth 1.2 is expected to resolve a lot of issues with the present Bluetooth 1.1 standard. It will use a frequency hopping algorithm, so that communication will not be disrupted by other devices using the same frequency. You'll also see improvement in sound and data transmission capability once Bluetooth 1.2 devices hit the stores. All these devices will be backward compatible with existing Bluetooth 1.1 devices.

Using Bluetooth to make a PC, mobile and PDA talk to each other was the most obvious use, but now we're going to see many innovative applications such as reading the temperature, opening garage doors, printing TV listings via a neighbouring printer, or a refrigerator alerting us of a power failure. It could also make for Bluetooth-enabled credit card terminals to be used by hawkers that will be connected to a mobile phone.

Bluetooth is going to make its mark in Asia more than anywhere else in world, due to smaller homes where every device is within ten metres of anything else. ■

Vipul Shah is a chartered accountant who writes and consults on Internet, e-commerce, banking and finance technologies. He can be reached at digit@vipulshah.com



Robo Sapiens

The new wave of reconfigurable robots will learn, change themselves, and evolve

Do a Google search on 'robots will', and you see: 'Robots will steal your job...', 'Robots will kill...', 'Robots will change us...', 'Robots will make good friends...', 'Robots will manage your network...', etc. Clearly, people have a lot of beliefs about what robots will do, and this is justified because robots, or bots, already do so many amazing things. They give back massages, vacuum entire rooms and play soccer with each other. Not many people are aware that we are on the cusp of a new wave of artificial intelligence, which promises robots that will learn about their environment, change as the environment demands, improve themselves and, possibly, reproduce. Whatever else robots may or may not

do, we're sure of a couple of things—they will learn; they will change themselves; they will evolve by themselves.

Roach bots

Robotics is rapidly embracing ideas from other disciplines, leading to new techniques and sub-technologies. Honda has its Asimo humanoid, and Sony has its robotic Aibo dog, both of which are impressive. However, the Asimo and the Aibo are 'static' bots in the sense that they do not dynamically adapt to their environment; what they learn is only facts that are added to their knowledge base. These facts do help them function better, but cannot help them evolve in any way. Asimo and Aibo-style research will not drive the future; it's evolutionary

and animal-mimicking techniques that will dominate. Animal-inspired robotics aims at emulating certain animals, especially insects and the like. Biologists and engineers have worked together at producing bot versions of popular insects such as flies and cockroaches. If you're afraid of cockroaches, then the three bots at Case Western Reserve University, Ohio, United States, are your worst nightmare: they're huge, they look like cockroaches and they do the things that cockroaches do—jump, fly, and so on. The goal of this experiment was to build machines that could go where humans won't—inside nuclear reactors, or into a fire. The inspiration from biology is driven by laziness: why engineer a creature when nature has already done it for us?

The biologists' payoff is that they get to learn how cockroaches function. For instance, Joseph Ayers, a neuro-physiologist at Northeastern University in Boston, is now working on a robot lobster. He says, "The experiments you do on the robots tell you what you ought to be looking for within the animal." Some labs have reported that studying how insect bots fly led them to a conclusive explanation of how real insects fly—which, incidentally, is through complex and unconventional aerodynamics.

The Case Western experiment is a typical example of the intermeshing of disciplines that's happening in robotics. The program started with Randall Beer, a computer scientist, who was frustrated by the slow progress of AI. He sought guidance in the nervous systems of simple insects. However, animal bots are the tip of the iceberg when it comes to the New Wave. They may teach, but they don't learn.

Artificial life

It's only natural that a field called artificial life should have come up, since all scientists at some level want to play God. Artificial life comes from the idea that complex systems such as life, arise from simple interactions between enti-

ties in suitable environments. The field attempts to model as well as understand life using simulations that involve complex algorithms. For example, the Artificial Life Group at MIT discusses 'all things pertaining to the modelling and synthesis of biological systems.'

An ambitious artificial life project in 2002 gives a flavour of the kind of research that goes on: A team at the University of Zurich, Switzerland, created computer simulations with muscles, senses and nervous systems. These simulations were 'grown' from artificial embryos. The genome, or life code, for each of these was a string of random numbers. The creatures were real to the extent that their cells contained simulated, reactive chemicals. Josh Bongard, the head of the team, was hopeful that the creatures might develop brain-like regions when assigned tasks.

Appropriately, many of the algorithms used in such studies are genetic algorithms, which are a subset of what are known as 'evolutionary algorithms'. The concept of genetic algorithms comes from the evolution of life itself—survival of the fittest. People in artificial life labs often work with living tissue; but what about working with hardware? Hardware that knows itself, and can self-modify? Hardware that lives? That's

where evolvable hardware and evolutionary robotics come in—the marriage of robotics with artificial life.

Actually, there's a whole slew of technologies and disciplines that will make the smart bots of the future possible: traditional robotics, neural networks, evolutionary algorithms, programmable hardware, evolvable hardware, and many others. Every smart bot that's rolled out of a lab was born with the help of one or more of these techniques.

Robots that learn

Before the concepts of self-modifying machines, there was the idea that a robot could learn things—learn, adapt and improve. An example is Adam, a learning robot developed at Monash University, Australia. A niche environment called Eden was developed for Adam, with the expectation that he would learn and evolve there. Adam learnt to navigate within his environment; for example, how to avoid bumping into walls. That's already a major leap ahead from 'static' robots such as Aibo and Asimo, which learn only facts. As in artificial life, learning robots often use evolvable algorithms to drive their learning machinery, which, in hardware, is often a neural network of some sort (*See Box 'Training and Evolving Neural Networks', page 27*).

A bot-eat-bot world

If Adam doesn't sound interesting enough, here's something way out: in March 2002, at the Magna Science Adventure Centre in Rotherham, England, robots were divided into predators and prey, in a specially constructed environment. The aim of the experiment was to see if and how the community of bots would evolve an ecosystem. Wired magazine called it 'an experiment that sounds like a science-fiction film plot, but is actually as close to real life as artificial intelligence can get.' The people at Magna billed it as 'the largest experiment ever in artificial intelligence.'

It's not science fiction, but there's very little about the experiment—which ended in August 2003—to make it sound like science fact. The prey robots would have to feed by charging their solar batteries by sitting under artificial trees made of light. The predators would feed on the prey by hunting them down, immobilizing them, and insert-

Genetic Algorithms

Genetic algorithms are able to find optimal solutions to problems using the basic principles of Darwinian evolution—mutation, crossover, selection and so on. In many instances, they can find optimal solutions much faster than other algorithms.

Genetic algorithms work in the following manner: a chromosome in biology is a collection of genes. When working with genetic algorithms, think of a gene as a bit, and of a chromosome as a string of bits.

Each initial chromosome, in a genetic algorithm simulation, is taken to be a possible candidate solution. In this way, the 'solution', which is not actually a solution yet, is encoded as a string of bits. The chromosome, or string, may be made up of random genes—it can be a random string of bits. Now, with the initial collection of chromosomes at hand, each chromosome is tested for 'fitness', i.e., how good a solution it is. The ones that are better are more likely to reproduce.

Given the chromosomes that will reproduce, the crossover step comes in: two such chromosomes (remember that these chromosomes are strings of bits) are chosen, linked together, and at a particular point, are cut and joined each half to the other.

Mutation comes in at this point. After crossover, some bits (not too many) may be randomly changed, in order to introduce some variety. This is done once every few generations. The crossover and mutation steps are repeated as many times as required to produce the same number of chromosomes that were there in the initial population.

The new collection of chromosomes is again tested for fitness, just as with the initial population, and the cycle continues. So far, one 'generation' of the algorithm has been completed. The entire process is repeated until the collection of chromosomes obtained is a 'good enough' solution to the original problem.

ing an ‘energy-sucking fang’ into a specific spot on them to transfer battery power to themselves. This may sound a little grey, but it’s as simple as that. At Rotherham, predator and prey robots struggled for survival, feeding and hunting, with their creators hoping they would succeed in building a civilisation. How would they evolve? Quite simply, by the Darwinian principle: each bot would upload its genes, when they changed, to a central server. And in the next generation, only those bots that lived long enough would have their genes added to the gene pool.

But there’s more. In June 2002, one of the bots went missing. It had escaped. It had left the arena for a small repair to its body work after a day of particularly hard battling. It forced its way through a small gap in the barriers, went down the access slope to the workshop and out into the car park. It somehow made its way to the entrance gates, only to be found by an unassuming visitor who nearly ran over it in his car.

Noel Sharkey, the brain behind the Magna experiment, said he was thrilled that the robots have become so intelligent. He said it was fantastic and, “there’s no need to worry, as although they can escape, they are perfectly harmless and won’t be taking over just yet!”

However, in a cyberchat with the BBC, when asked whether there would be a time when we wouldn’t be able to distinguish a human from a bot, Professor Sharkey said “It’s unlikely that anything we think of as a robot now will be indistinguishable from a human. I believe that metal will never be mental.”

Self-modifying software and hardware

News about robots that can play with your dog, or set up a LAN, is boring. We’ve come to expect robots to be able to do stuff like this. And after experiments like the one at Magna, we expect them to be even smarter. In the fundamental shift that will take place, robots will be able to know about themselves, and make changes to their software and hardware.

Jürgen Schmidhuber, a major contributor to the field of learning robots, talks about Gödel machines—how a machine will modify its software. A robot powered by a Gödel machine will be able to modify its code, as soon as it proves that its performance will improve with the modified code. As an example application of Gödel machines, Schmidhuber mentions a robot that interacts with a partially unknown environment, trying to find hidden gasoline depots to occasionally refuel its tank. Such a robot, if it had a Gödel machine for a controller, would be able to optimise itself so that it lives the longest it can, by refuelling itself optimally.

Self-modifying software is one thing, and self-modifying hardware is quite another. This is generally called ‘evolvable hardware’, and there are



Noel Sharkey
Interdisciplinary
researcher
University of
Sheffield, England

// The name of the game is to develop extremely simple mechanisms that, when placed in the world, exhibit complex behaviour. //

several research groups working towards the fabled robot that opens up a body part and repairs it when something goes wrong.

Artificial evolution was previously relegated to software simulations, carried out on neural network configurations, and that was considered enough. But as Adrian Thompson of the University of Sussex—a pioneer in the field of Evolutionary Robotics (ER)—points out, “There are three reasons why we would want hardware to modify itself. First, hardware evolution can deal with real-world physics, which is difficult to analyse or model in simulations. Second, when it comes to interacting entities, it is difficult to precisely model size, location, shape and so on, in simulations. And third, the characteristics and interactions of the evolving entities do not remain the same with time—physical evolution will be able to get round this problem.”

FPGAs

FPGAs, or Field Programmable Gate Arrays, are programmable digital logic chips. No soldering, or any such manual work is required to change their function. All that is needed is for the FPGA’s program, or desired behaviour, to be downloaded onto the chip. The program for the FPGA, or the function that it will perform, needs to be first designed on a computer, and then translated into a form understandable by the FPGA—that is, it needs to be compiled. The compiled program is downloaded onto the FPGA, and it then behaves according to the design. For example, you can program an FPGA to perform a basic logic operation, such as ‘And’. Of course, they can be programmed to perform much more complex operations.

Bots changing themselves

So what exactly does evolving hardware look like? Not like a humanoid wielding a screwdriver—at least not yet. The Khepera robot (<http://www.k-team.com/robots/khepera/>) has been modified to have two layers of FPGAs (See box ‘FPGAs’ above) on top, which allow evolution of the robot’s control system. FPGAs are hardware that actually changes as the robot evolves.

Evolution can be used to find novel circuit designs by searching a larger ‘design space’ than is accessible to humans. The evolution of circuits has led researchers to conclude that they could learn from it—they could discover design principles from evolved hardware.

An adaptive hardware system that learned the behaviour of an expert robot controller, using a genetic algorithm, has been developed. This controller could be used if the primary controller failed. Think of this as a robot developing a spare brain for itself after inspecting its original brain. Parts of robot controllers have also been evolved, which interact with the environment dynamically, in a manner that would not have emerged if traditional design had been used.

Robots have evolved to visually discriminate between objects of different sizes. They have evolved over a period of time to integrate sensory and motor

information with their inbuilt knowledge, so as to use the information later to better respond to their environment.

The Evolutionary Robotics Group at the University of Sussex evolved—not trained—a robot to identify a triangle in a room. The robot was not programmed with any knowledge of geometric shapes; it was evolved over several generations, and the evolution was stopped when it had learned to identify a triangle. And yes, robots have even evolved a language to communicate with their foster parents, the researchers in the labs they were born in.

Evolvable hardware

Hugo de Garis, one of the pioneers in the field of evolvable hardware (E-Hard), has a useful definition of the term. According to him, E-Hard is the marriage of reconfigurable hardware and evolutionary algorithms, often genetic algorithms (See box 'Genetic Algorithms', page 25). Think of the hardware as living tissue. It needs to be programmable; that is, its behaviour—like that of living tissue—can be dictated by software of some sort. That's where FPGAs come in.

Living tissues have chromosomes that direct how the tissue will behave. Chromosomes come in strings of basic units, and their message is encoded in the way the basic units are strung together. In the case of E-Hard, the chromosomes used are genetic algorithms, encoded into bits. These cause the hardware to behave in a certain way. The codes that make the hardware perform better are allowed to have more offspring—the number of pieces of hardware they command—in the next generation of the algorithm. Evolution occurs by randomly mutating the chromosomes that define the hardware's behaviour, as it happens in nature.

Think of a robot that has two motors. If one of the motors fails, the

Training and Evolving Neural Networks

Neural networks consist of layers of processing units connected to each other. These connections have weights; think of the weight as the 'importance' of the connection, or how much of a role it plays in the entire network.

Inputs come in at the lowest layer, and the output is from the output layer. This is how neural nets learn, or are trained: the inputs are given, and an output is obtained. The output depends on the input, the connection weights, and on the topology of the network—that is, how many nodes and layers it has.

If the topology has already been decided upon, it is the connection weights that are changed according to the output. The output is checked, and its deviation from the ideal output dictates how the weights will be changed. After the weights have been changed,

the output will be different the next time round. This new output is then used to change the weights again, and so on. The process is repeated until the output reaches an optimum.

The neural net can evolve in one of many ways, including using a genetic algorithm. Notice the similarity between the training of a neural net and the evolving of a genetic algorithm. It is easy to see how a genetic algorithm's evolution can be applied to a neural net. Each generation of a genetic algorithm produces new collections of strings. The neural net can change its topology and connection weights, based on the contents of the collection of strings. For example, the bits in the strings that the genetic algorithm has produced may translate directly into connection weights.

robot will malfunction. In anthropomorphic terms, the robot wouldn't know what to do. However, if the hardware were evolvable, the robot would eventually repair the faulty motor, and begin to move properly.

Evolving robots: the Implications

Consider, from a designer's perspective, what evolving robots would mean. Instead of having to technically detail how a bot would go about exhibiting each bit of its desired behaviour, he would simply specify what he wanted from the bot.

Engineers would have an easier time because, with regular robots, the overall behaviour needs to be divided into modules, and each of these has to be described precisely. If the robot could evolve, a generic design combined with the designer's specifications would do, and the required 'global' behaviour might emerge. Robots could be mass produced and allowed to do their duties in special environments. The good ones would be used, and the bad ones simply thrown away!

How? Recall the Gödel machine. A robot equipped with a Gödel machine for a controller can modify its software; and with modifiable hardware, it can change its physical circuitry. Now consider such a robot that is given a goal. It would do some part of its job, inspect what went wrong and what went right,

check its own code and hardware, and modify itself suitably... on and on, until it became perfect, or until it was destroyed—if it took too long.

Evolving robots know what they are. They know what they're supposed to do. They can change themselves. They're alive!

The bots have arrived

Sun Microsystems co-founder Bill Joy's now well-known article in *Wired*, titled 'Why the future doesn't need us', began with the subheading: "Our most powerful 21st-century technologies—robotics, genetic engineering, and nanotech—are threatening to make humans an endangered species." Joy went on to express his fears about the new technologies, saying, for example, that robots might be dangerous because they might replicate; that we may not survive our encounter with the new species, and so on.

Everyone has a point of view, and something to say about this—some say Joy is exaggerating, some share his concerns. But there's no doubting the fact that robotics has come of age; it's only a matter of time before we relegate more and more of our duties to the machines.

The 'new species'—humanoid, bot, part-human-part-bot, whatever—has already been born. ■

RAM MOHAN RAO
ram_mohan@thinkdigit.com



Jürgen Schmidhuber's homepage:
www.idsia.ch/~juergen/

The Evolutionary Robotics Homepage:
gal.ip.rm.cnr.it/evorobot/

Evolutionary and Adaptive Systems at the University of Sussex:

www.cogs.susx.ac.uk/easy/index.html

Bill Joy's article in *Wired* Magazine:

www.wired.com/news/gizmos/0,1452,50247,00.html



Ocular Magnificence

Linksys Wireless-B Internet Video Camera ▼ Eye stand alone ▼

Using the 802.11b wireless network or an Ethernet cable, this video camera can send live video to a Web browser, using the inbuilt Web server. It connects directly to a network to send a 320 x 240 video stream compressed using the MPEG-4 standard. It's wall mountable, and can also be programmed to send an e-mail with a short video attachment, whenever it detects motion.

Price: USD 250



Presenting cameras that obviate the need for saying cheese—they entice you with their features, and of course, their good looks

◀◀ Logitech QuickCam Orbit Eye follow you

With automatic face tracking, this camera adjusts itself to always face the user. The ball shaped camera sits on a stand, and can be tilted 180 degrees horizontally and 90 degrees vertically. You can set it up to automatically update images on your Web page. It can record videos at a resolution of 640 x 480, and photos at 1.3 megapixels.

Price: USD 129

iSight ▶▶ Beautiful eye

Encased in an aluminium-alloy body, Apple's iSight Web camera has an on-board processor that automatically adjusts such parameters as sharpness and white balance. The dual microphones use an algorithm to eliminate background noise, and reproduce only essential sounds.

Price: USD 149





◀◀ **Logitech QuickCam Cordless**
Single-horned eye

The cordless camera from Logitech gives you 22 metres of freedom. It also allows you to send live video to mobile phones using the Logitech Mobile Video service.

Price: USD 179



Pentax DigiBino DB100 ▲▲
Powerful eyes

This camera-cum-binoculars set has a magnification factor of 7x. It can record both still images and videos, which it stores on its 16 MB memory card.

Price: USD 242

Sony Cyber-shot U ▶▶
Tear proof eye

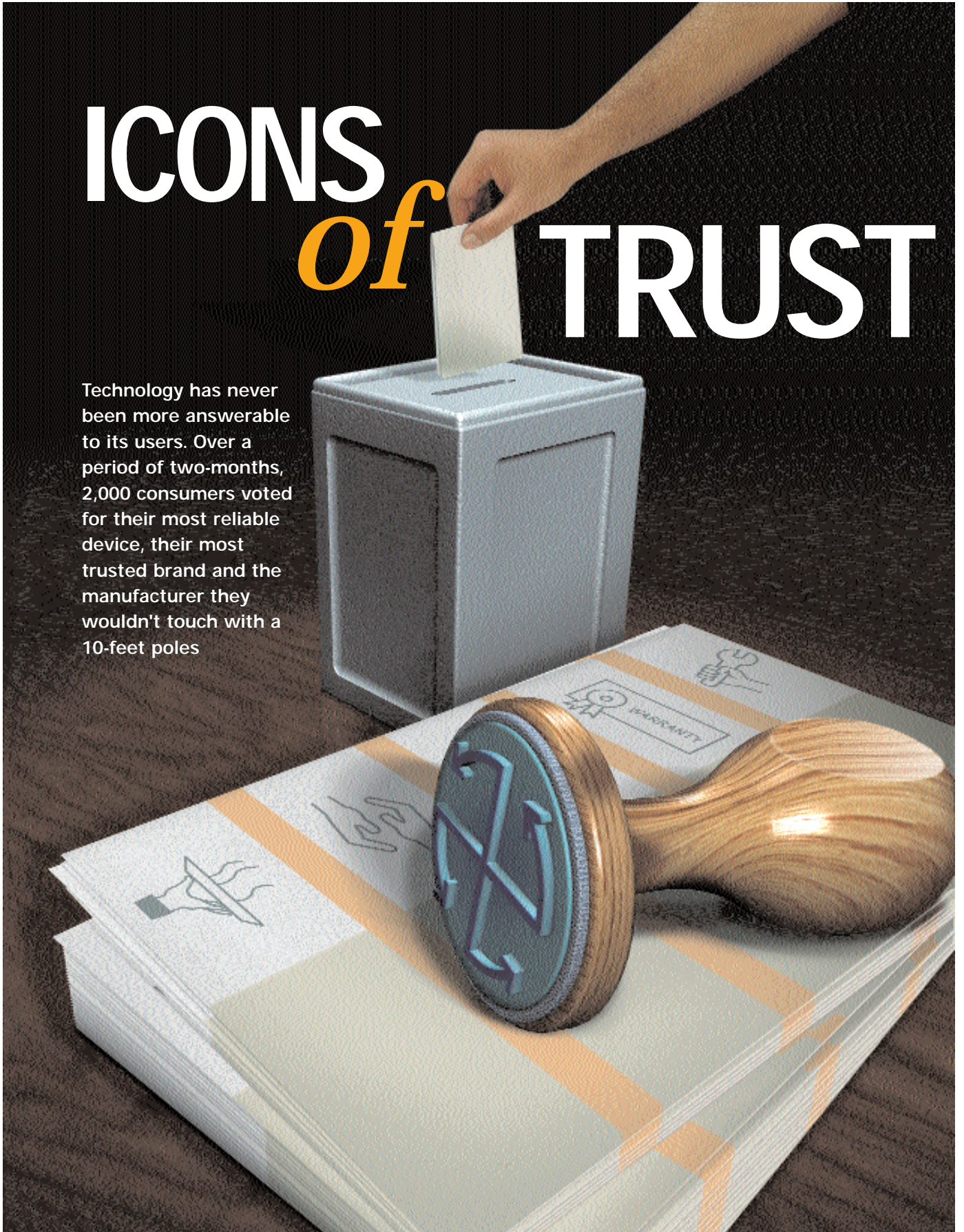
Put it up to 5 feet under water, and you have a camera that still works in top gear. You can operate it with one hand, because of its vertical design. It has a 2.0 megapixel effective resolution, 1x Optical Zoom and a 1.0 Hybrid LCD Monitor.

Price: USD 249



ICONS *of* TRUST

Technology has never been more answerable to its users. Over a period of two-months, 2,000 consumers voted for their most reliable device, their most trusted brand and the manufacturer they wouldn't touch with a 10-foot pole



Total Cost of Ownership, TCO, you must have surely run into this TLA (Three Letter Acronym) on the Byzantine streets of technology and consumerism. It must have peddled its salient features to you, likely that it pleaded with you to consider it closely before buying a printer. Good advice, listen to TCO before making that decision. We would like to point out however, that the concept extends to more than a printer, its cartridge and the number of pages that it prints per minute.

Every time you struggle with your sound card driver, or with your digital camera software, you are wasting your time, wasting your money. Consider the case of Vivek Pannu, a computer engineer from Hissar in Haryana, and his LG CD-Writer. Vivek, and

the drive in question, have a difference of opinion—while Vivek wants the drive to perform its civic duties, the recalcitrant Writer disagrees. Thus he has to take his drive to the nearest LG service centre, back and forth, wasting both precious time and money. “I was really humiliated by the service centre,” he bemoans, “I burnt petrol worth my CD-Writer.” TCO at its worst, he had to pay an additional amount of money just to get a piece of hardware working.

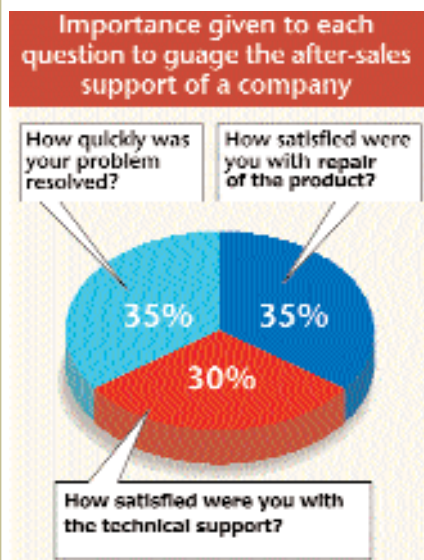
This is where the concept of Service and Reliability steps in. How frequently does a product break down? Does a company offer good after-sales service? Where are its service centres present? Does it have any call centres? How helpful are its technical staff? Did they solve your problem?... questions

to that effect need to be asked. These factors determine the true worth of your purchase. Is your MP3 player a good buy in the long run, or is it a money drain forcing you to spend hundreds on its battery every month?

How do you measure something like this? We decided to ask you, for surely there can be no better public to ask than one that buys and deals with technology on a daily basis. The exercise was performed as a survey—asking the right questions and logging the answers, the results were then fed into the Digit Supercomputer (a bunch of diligent geeks that live on numbers), and analysed for ease of digestion. We present the results of the survey: everything from cell phones to desktop computers, how reliable is that product you are planning to buy? Find out.

The Method behind the Numbers

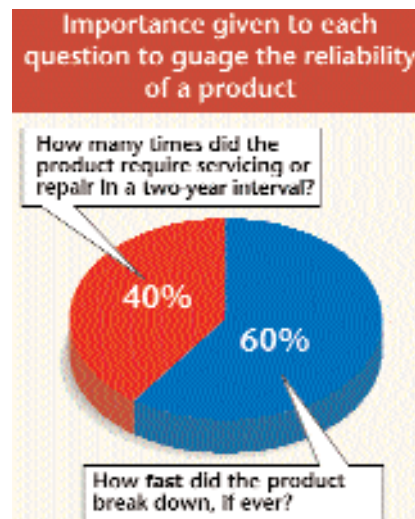
We first prepared a list of questions to help crystallize reader experience with a particular product. For example, queries to the nature of “When did your product first break down?”,



along with “How many times did your product need servicing or repair within a 2-year period?”, helped us get a handle on the reliability of a particular product; similarly questions were formed to gauge the quality of after-sales support that a company offered. The questionnaire was posted on our Web site: www.thinkdigit.com. Readers were invited to offer their feedback through two means: by replying to an insert in *Digit* magazine, or as an e-mail request to take the survey. Both the methods were tagged with a unique numerical identifier. A respondent would log onto the survey page using this number and once logged off, the identifier would expire. This ensured that there was no duplication in responses.

The response sample was 2012, based on which a statistical analysis was done to determine, amongst other things, the Reliability and Service Index. To understand the importance given to each question, please see the accompanying pie-charts.

From the Reliability Index (RI) and the Service Index (SI), an Overall Satisfaction Grade (OSG) was generated for the categories involved. The grade was meant to indicate how a particular company fared overall: taking both reliability and service into consideration, within a sub-category. To do so, the indices in question were averaged with a weightage in mind: both RI and SI were awarded a 50-50 split up; there were a few exceptions to this rule, which are duly noted in the accompanying table. As an example the hard disks were given a 70 per cent importance on the matter of reliability (RI), and a 30 per cent importance was given to



their Service Index (SI) A company that scored the highest OSG was awarded the Digit Icon of Trust.

Finally, we determined a Mode for the entire industry—covering all categories—from cell phones to desktop computers. This mode figured as 4.5 for the Reliability Index and 3.0 for the Service Index. To put things into perspective, when a sub-category earns an average mark of 4.0 on the Reliability Index, it would translate into the fact that the particular sub-category is well below the industry standard, as far as reliability is concerned. As an example, the digital camera sub-category (consisting of companies ranging from Sony to Creative), scored an overall Reliability Index of 4.54, just above the industry (consisting of all surveyed sub-categories from digital cameras to notebook computers) standard of 4.5.

In each sub-category only those that received over 5 per cent of the votes or 10 votes (whichever was higher), were considered qualified for analysis. This cut-off was essential to remove any generated bias due to a low number of vote-count in that sub-category.

A certified survey

The research process was verified and certified by The Research Pacific Group, which is headquartered in Singapore and has presence all across the Asia-Pacific region. The Research Pacific Group is a full service marketing research provider, which has conducted research throughout Asia for over 12 years; its core competency is providing ‘Best In Class’ customised Marketing Research solutions throughout Asia.

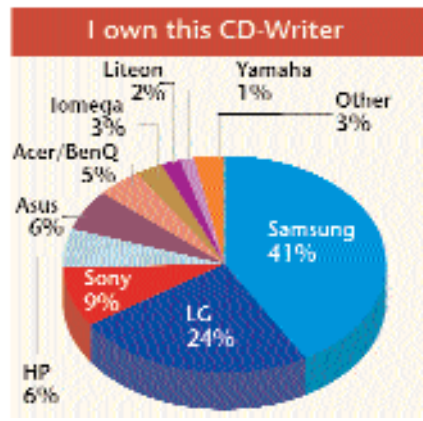
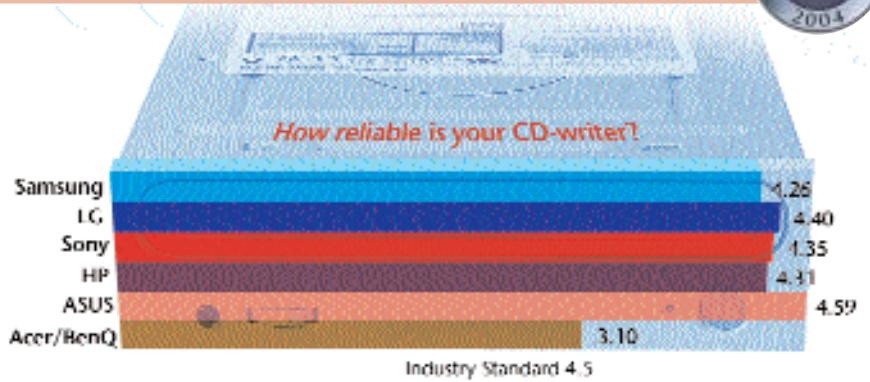
Overall Satisfaction Grade (OSG)		
Product	RI	SI
CD Writers	50	50
Cell Phones	60	40
Desktop	50	50
Digicam	50	50
Display	50	50
HDD	70	30
Laptop	60	40
MP3 Player	50	50
Printer	50	50
Scanner	50	50
Sound Card	50	50

CD-Writers

Winner for CD-Writers is **LG**



A few months ago, we discontinued testing CD-ROM-only drives, deciding to instead test CD-Writers and other so-called combo-drives. With a CD-Writer priced at almost the same price as a solitary read-only drive, we reasoned that consumers would stop purchasing the latter, and opt for combo-drives and CD-Writers instead. Results of the survey back that reasoning, as a healthy 940 votes rang for CD-Writers.



Of the number, Samsung took the biggest piece of the pie with a count of 404, while LG came in second with 233; it was a race similar to the one fought on the computer display front. Here, however, the base number of more than 900 ensured that Sony, HP, ASUS and BenQ got more than five per cent of share.

ASUS came across as the most reliable drive, and was top dog on the Reliability Index, followed some distance away by LG. Consumer satisfaction with technical personnel in service centres, and with repair or replacement of defective prod-

Performance of **Acer/BenQ** CD-Writer drives was the **Worst** in terms of consumer **Satisfaction**

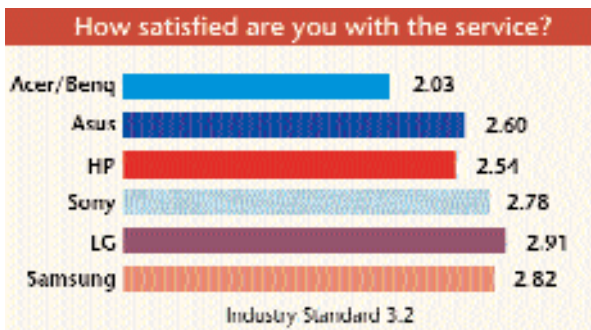
ly open and close the tray." Similar responses of "excellent writing quality but poor build quality", "I got tray problems", and "disk gets stuck while inserting" echo for ASUS and Samsung as well. The lens is also a problem area. While some brave souls clean the lens by removing the cover of their drive (and instantly voiding their warranty in the process), others are forced to replace their drives since a lens costs half the price of the drive.

Sony came under fire from more than one reader for its lacklustre after-sales support. Ravi Pherwani opined, "Sony is one of the most trusted names in this industry today, but it needs more efficient service management". Vidhu Bhushan, a professor from Mumbai, complained, "The distributors of Sony products show a lot of indifference in dealing with the customer." Harsha, himself a technical support personnel says, "Sony India products are sub-standard. Their imported products are far better than the ones manufactured here. It will be better if Sony can improve the quality of products manufactured and sold here."

On the software front, there were minor niggles concerning drivers and some complaints on the choice of software provided with the drives, with one reader stating that he prefers Nero Burning ROM to the software supplied.

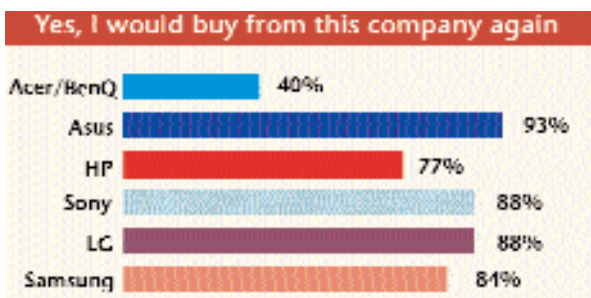
// A very sensitive CD-drive! The tray is a nightmare for everyone... gets misaligned... **//**

Ashish, on his Samsung CD-Writer
New Delhi



ucts earned LG the top-spot. Samsung earned the second rank in terms of service, underscoring the importance of good after-sales support and service centre coverage.

The most common cause of customer woe was mechanical problem with the tray of a drive. Manu Sekhri, a student from Mumbai, pointed out, "Acer should make the product more reliable. The Writer I have is two and half years old, and although it writes fine, the tray is not working. I have to manual-



MOST RELIABLE CD-WRITER: ASUS RUNNER-UP: LG Electronics
MOST SATISFACTORY SERVICE: LG Electronics RUNNER-UP: Samsung

Cell Phones

Winner for cell phones is **NOKIA**



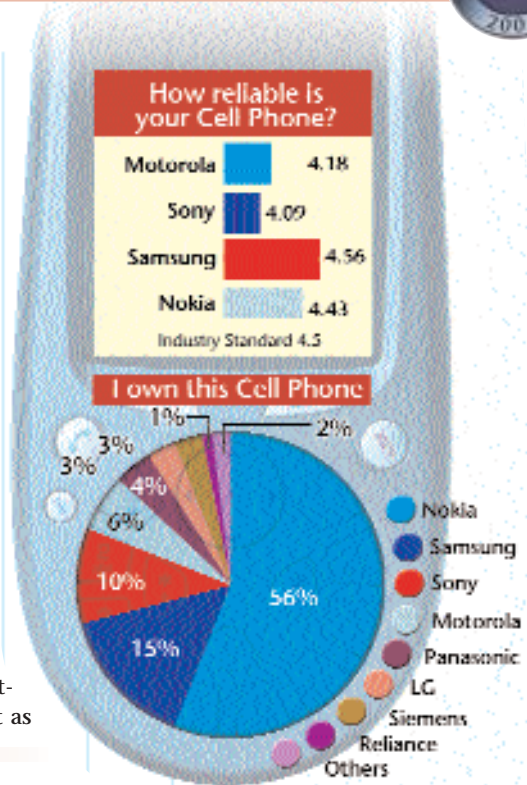
Cell phones have arrived. As a reminder, an especially irritating ring tone is probably calling to attention all living beings even as you read this; failing which, you are sure to run into someone with a hands-free kit, screaming right next to you in a crowded bus or train. Irritants at times, cell phones can hardly be ignored as great communication devices. With plummeting prices of both handsets and services, these amazing pocket-monsters will only proliferate.

Nokia's stranglehold in this particular segment is strong, and not entirely without merit. Of the 920 responses generated, an amazing 520 went Nokia's way. The closest competitor, Samsung, got a paltry 134 mentions, while Sony Ericsson and Motorola gathered 90 and 56 votes respectively. Not a fair fight by any means, and one that demanded that Siemens, Panasonic and LG pack up and

repairs in a two-year period, and a lower failure rate after purchase. This pushed Nokia to second place, followed by Motorola and Sony.

Nokia scored on service—problems were resolved the quickest; the satisfaction level with its technical personnel was the highest, as was the satisfaction with a repaired or a replaced unit. Interestingly, Sony Ericsson scored the lowest in satisfaction with repair, even though the company offers a stand-by unit to a customer to tide through the delay; something that Nokia does not.

One reader, who wishes to be unnamed, was not too happy with Nokia's services said, "It is very expensive, they charge labour for each component they replace...", while Sanmeet S Sahani was so put-off by Nokia's service that he went as



// The phone hung just like Windows; I had to search for the three magic buttons, [Ctrl], [Alt] and [Del]

// Suneel Mohan, on his Sony Ericsson T105 phone
Karnod, Andhra Pradesh

look elsewhere for the five per cent cut-off needed to be considered for the survey analysis.

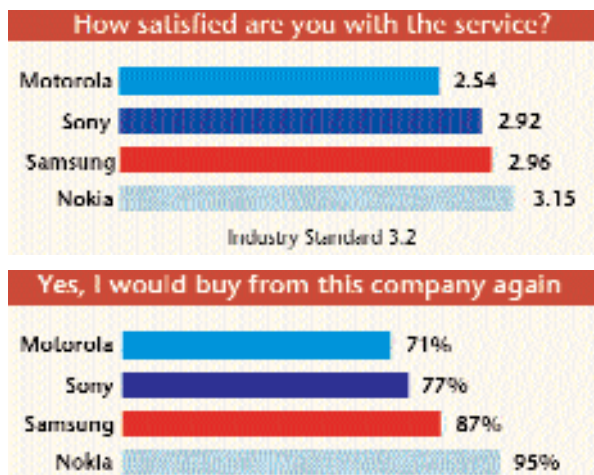
Nokia phones were owned the longest, with Samsung a close second. Samsung beat Nokia on reliability, by statistically scoring better on number of

far as to say, "I have been a Nokia fan for a long time, but after the service, I felt that Nokia has gone to the dogs..." Vidhu Bhushan, an associate professor, shed further light on the source of dissatisfaction by claiming, "The technical support staff lacks knowledge. It seems

as if they are equipped to provide only superficial answers, and not solve the problem in anyway. Also, these people do not know the salient features of various models and try to push either a very expensive or an inexpensive model towards the customers." Samsung was also chided for its service with this comment, "Samsung's service for comput-

Nokia earning the highest on its Service Index can be traced to the fact that consumers were especially happy with the **swift** manner in which it solved problems

ers is good, but for mobiles is very bad", while others pointed out that Samsung phones lack features. One reader said that the tie-up between Samsung and Reliance (the former provides sets for the latter's CDMA service) isn't making things easier for getting the handset repaired. Even Sony Ericsson took a thrashing on its service front: Jatinder Singh, a computer operator, thinks the company "still lacks the professional touch in India, especially in customer relationship. It will cost them dear if the situation is not addressed fast."



MOST RELIABLE CELL PHONE: Samsung RUNNER-UP: Nokia
MOST SATISFACTORY SERVICE: Nokia RUNNER-UP: Samsung

Desktop PCs

Winners for desktop PCs are **HP** and **ASSEMBLED PCs**

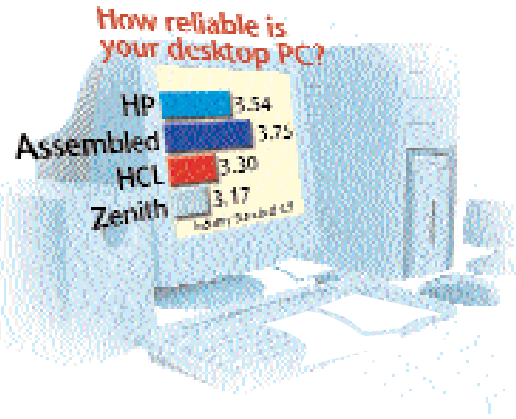


Assembled or branded? The supreme decision faced by anyone while purchasing a personal computer. It is as if the rest of our technological existence hinges on that one choice, and perhaps it does. For, the right path leads to product satisfaction, while the other is a rocky trail to electronic tribulation and support headache. Or is it? Our consumer survey certainly helped burst an old bubble that branded PCs are the way to go if you require technical support and after-sales product satisfaction. Surprisingly, the popular assembled PCs came up on top on both Reliability and Service Indices.

The desktop PCs category attracted

812 votes, a majority of which (237) went HP's way, closely followed by assembled computers tallying 194 mentions. Even if India has traditionally been a assembled-PC market, branded PCs have made significant inroads. HCL came in at no. 3 with 117, and Zenith was fourth with 75 votes. It must have been no mean task going against the peer-to-peer network that is the assembled market in India. The initial surprise of assembled units scoring on after-sales satisfaction can also be attributed to this peer-to-peer network of a friend, a colleague or a friend's colleague or a colleague's friend, who probably assembled your PC.

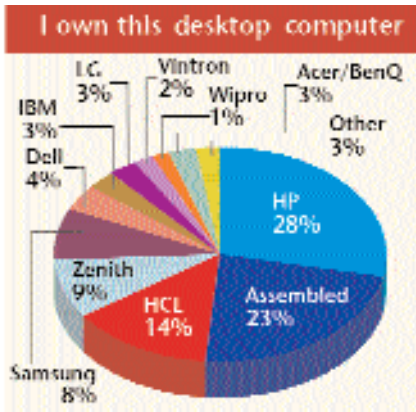
Indeed, the community of assemblers has roots in both grey markets, where they can source cheap parts (and offer a warranty to boot), and an engineering pool comprising recent graduates or diploma holders. The technical and the spares support is thus very much present. Add to this the fact that help is just a phone call away, plus the knowledge that the person on the other line will be receptive (you, or someone you know, probably knows the person), and you have all the makings of an excellent support group. Like Gaurav Lakshkar



Zenith was the quickest in **providing solutions** to their problems; respondents were also the most satisfied with **technical personnel** of assembled computers

ity, "Assembled PCs are flexible, and I can upgrade them easily; affordability, "I prefer assembled machines for their affordability; the customisable configuration and the "I would rather assemble my PC myself" bragging rights. Some respondents like Siddharth Deb Varman from Bangalore cautioned against using assembled systems. A student of management, Siddharth owns an assembled PC. He says, "Though assembled systems are cheaper and can be more personalised, the fly-by-night operators have become the real bad apples in the cart, and need to be rooted out." He is referring, of course, to assemblers who are here today and gone tomorrow. It is thus essential to do business with known persons, who have a certain amount of positive history and come with recommendations.

As for branded systems, HP is doing pretty good for itself. Its customers are satisfied by both its service: "It's a great

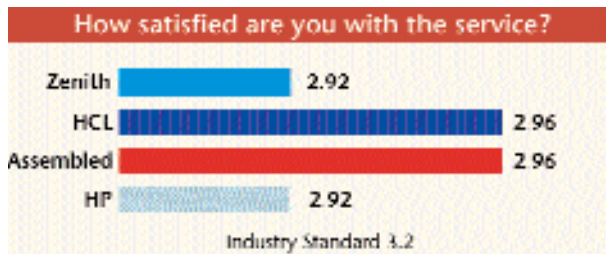


I would rather assemble my PC myself

V Vineeth Kumar, on assembled computers
Maharashtra

points out, "Whenever I take my problem to the vendor he always welcomes me even after the warranty period has expired. He always helps me in troubleshooting the problem."

Then there are the traditional reasons for opting for assembled computers: Be it flexibil-



MOST RELIABLE DESKTOP COMPUTER: Assembled PCs
 RUNNER-UP: HP
 MOST SATISFACTORY SERVICE: Tie between assembled and HCL PCs
 RUNNER-UP: Tie between HCL and Zenith

PC; they are really good at service”, and with its network of service centres: “HP has got best networks, as its quality of service.” Does the higher cost of an HP computer scare away customers? Not if Qasim Zaidi, a software engineer from New Delhi, has a say in it: “HP products

may be a bit expensive, but the after-sales service more than makes up for it.” HP computers also scored high on reliability, beaten only by assembled computers. They did take a beating on the Service Index, mainly due to the fact that customers were not very satisfied

by the technical aptitude of service personnel—“the HP dealers should have well qualified engineers”, pointed out one respondent. HCL scored well in this particular field, and shared the highest Service Index along with assembled computers.

Digital Cameras

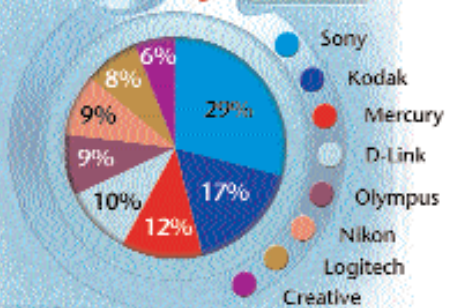
Winner for digital cameras is **NIKON**



Digital cameras are widely regarded as one of the most reliable consumer electronics products. When the user interface consists mainly of pointing and shooting, and the mechanics involve no moving parts, it is easy to believe that notion. Furthermore, the belief finds support from our survey.

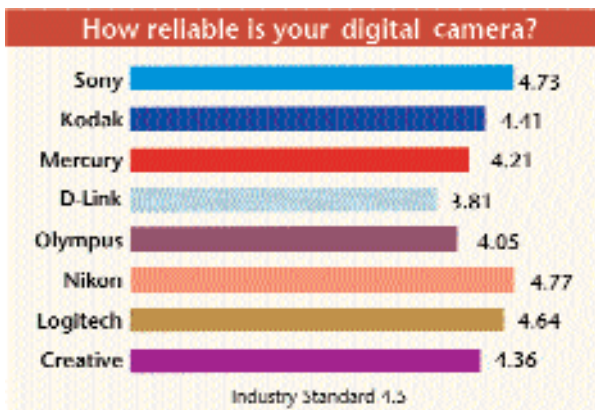
To begin with, the space of digital cameras saw the largest representation in the form of companies—Sony, Kodak, Nikon, Olympus and Creative were just a few of the vendors represented here. This showcases an interesting point—that as far as digital cameras are concerned, no single company has an unshaken hold over the market. Not surprisingly, Sony garnered the most votes, whereas Creative ended up with the least count—a reflection on how photographers, both professional and amateurs, think in terms of brands.

I own this digital camera



But brand-strength does not necessarily reflect upon reliability or consumer satisfaction. This fact was showcased by the fact that Nikon scored the highest on both the Relia-

common problem plagued users across brands—battery. This was either in terms of a faulty battery, or a bemoaning a low battery-life. The latter case being even more prominent with users of cameras with LCD screens. Some low-end solutions from Logitech were censured for the slow refresh rates of their CMOS lenses. On the software front, drivers and companion software were the cause of problems, “My Logitech camera is nice, but I experience problems with the software that they have provided”, Sudhir, a student, pointed out.



// Superb product, but eats a lot of battery when the LCD is used //

Priyanka Mukherjee, on her Olympus camera
Calcutta, West Bengal

After **Nikon**, **Logitech** consumers were the most satisfied with their **cameras**; customers of **Creative** complained about lack of after-sales support. **Olympus** users were the least satisfied with their cameras



bility and Service Indices, beating Sony by a whisker. Never mind the fact that 98 per cent of Sony users said that they will buy the product again as opposed to 87 per cent of Nikon users, who had a similar view.

In terms of hardware, a

MOST RELIABLE DIGITAL CAMERA: Nikon RUNNER-UP: Sony
MOST SATISFACTORY SERVICE: Nikon RUNNER-UP: Logitech

Displays

Winner for computer displays is **SAMSUNG**

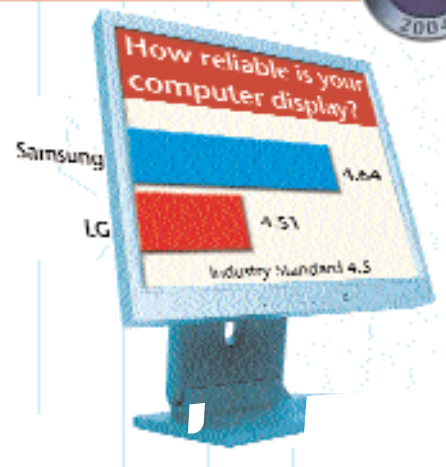


As a window to everyday technology, the display of a computer is the most important aspect of user comfort and satisfaction. Before making the all-important choice on size and technology, it would seem natural to choose between the seven major manufacturers of computer displays in India. However, our survey indicates that this segment of the consumer IT market is skewed heavily in favour of Samsung and LG Electronics. Indeed, of the 800-odd responses on displays, close to 500 were cast for Samsung, and more than 200 for LG. With such command over the segment, other manufacturers—big names at that—were pushed out of the survey altogether, since each one failed

to capture more than 5 per cent of the tally of 800.

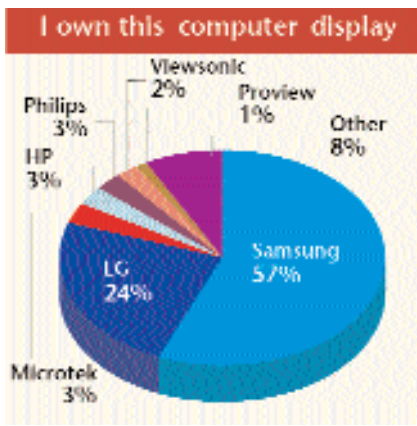
Not too surprisingly, a monitor or an LCD display comes across as one of the more reliable devices in our survey. Barring catastrophic events, these sculptures of molten glass and moulded plastic have few inherent and potential niggles. As one reader puts it, “Eight months after from buying a Samsung CRT, on the day of the Gujarat earthquake, my monitor fell from my desk, and a large crack appeared on its picture tube.” This is where service comes to the fore—either as a saviour or as a wedge between a customer and a company. Fortunately for those involved, this particular case was handled with grace: “Samsung replaced the picture tube within two weeks. The monitor is now working well.” Another satisfied customer of Samsung had this to say about the hassles of maintenance and service of his monitor: “No problem, like in that Suzuki Samurai ad!”

LG also earns equal praises for its “good servicing network”. So are things all OK as far as displays are concerned? You’d think so, but not quite. “Samsung monitors are good in general, and deliver excellent value for money. Service is prompt, but not always satisfactory,” opines Ankit Agarwal, an engineer by



that the frequency of electric current is low, which is why the device is flickering... and left! My monitor still flickers!” A flickering display, or washed out colours are two of the more frequent complaints that we registered through our survey for displays. While these problems can be traced back to a faulty power line or an ageing display card, the essence of service is satisfaction, and our readers feel that a company should satisfactorily handle a complaint; even if the solution entails asking the customer to repair the power line or replace the video card.

Another frequent complaint is that of the geographical distribution of service centres. Most service centres, as one can imagine, are located in the major metro cities and surrounding satellite towns. A customer not within the blessed area has to haul him or herself considerable distances, faulty equipment in tow. One of our readers in Gujarat had “to travel 50 km to the nearest service centre to repair my 19-inch monitor. It took a greater part of three hours, having suffered travelling with poultry.” Needless to say, such cases



“ All I can say is ‘no problem’, like in that Suzuki Samurai ad ”

Garavjeet Dhillon, on his Samsung monitor
Chandigarh, Punjab



profession. To learn why certain customers are dissatisfied with Samsung’s service, take the case of one N.P. Singh, also an engineer. “I have a Samsung Syncmaster 750DF that flickers continuously. After trying to reach their support engineer several times, he came one evening. He saw the monitor and without any test, he said

Samsung’s service personnel were the **quickest** of the lot to resolve problems, and garnered the **highest score** on technical support **satisfaction**

leave a bad impression on customers. Additional fallout of the distance problem is that of finding good service personnel in remote locations. Sometimes, the hired engineers are not experienced enough to handle problems, "For LG monitors, we had a service centre at Guntur, Andhra Pradesh, but they do not service well. They take a month's

time to service a monitor," complains Philip George, a computer programmer. He goes on to plead: "Please provide the service centres with personnel who know their job well."

Apart from these niggles, there are

requests for better software drivers—be it for alternative operating systems (especially Linux), or for avenues of entertainment and education ("display drivers should be advanced for gamers and Internet browsers").

MOST RELIABLE DISPLAYS: Samsung RUNNER-UP: LG Electronics
 MOST SATISFACTORY SERVICE: Samsung RUNNER-UP: LG Electronics

Hard Disks

Winner for hard disks is **SAMSUNG**

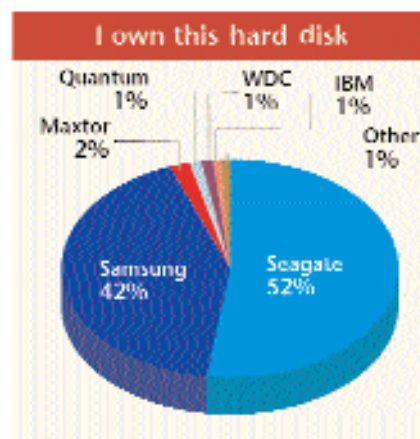


The mirror-smooth, dust-free disc travels at a speed of around 272 Kph. Not far, at a distance of 0.3 micronmeter—a typical human hair is 57 times as thick—flies an aluminium arm, moving from the centre of the glass-like surface to its hub up to 50 times per second. Want an analogy? Imagine a Boeing 747 airplane six inches above the ground. Behold the hard disk, a marvel of small-scale mechanics, nestling within your computer, laptop or MP3 player.

For us consumers, such numbers mean little. The marvel is lost with a crash or a bad sector; all that data gone! Not surprisingly, our reader feedback pertaining to this particular category evoked a lot of frustration, obviously... Data loss is never appreciated. Within this segment, two players emerged leaders—



Samsung and Seagate. Of the total 1,202 votes on hard disks, Samsung bagged 508 and Seagate 631, leaving others with less than five per cent of votes and forcing us to nudge them out of the survey analysis. Of the two, Samsung emerged the better choice, earning higher numbers for both customer satisfaction with its service, and for the reliability of its hard disk.

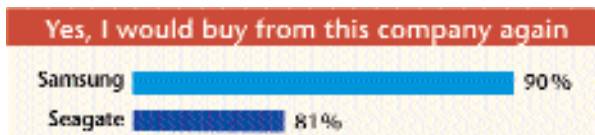


Cause of Bad Sectors

Hard disks are extremely sensitive to shock (approximately 30 per cent of hard disk failure is shock-induced). Hard disks without a home (a PC, for example), are very vulnerable as they are exposed to external shocks—as many as several hundred G-force per millisecond—incurred by mishandling, installation, etc. As the storage capacity of a hard disk's platters increases, so does the likelihood of collision between the disk and head, since they come closer with an increase in capacity. Even the slightest of shock is capable of damaging a hard disk: small shocks may travel to the core and cause a head slap (where the head of a hard disk, physically hits the platter's surface). When this collision occurs, particles form on the disc's surface and accumulate with time, creating friction with the head, thus increasing the temperature of the disc. This increased heat causes read and write errors, formation of bad sectors and data loss.

“ Seagate's after-sales service is very bad. Also it [hard disk] gives lots of problems ”

Deepak, on Seagate hard disks
 Ambala, Haryana



One of the most important factors in Samsung's favour is the warranty period it offers on its hard disks: all three years worth of it, as opposed to Seagate's one-year period. Time and again, readers pointed this out as a favourable number, secure in the fact that their data is as safe as it can be for at

least three years. As Hitesh Gupta, a student using both Samsung and Seagate hard disks pointed out, "There seems to be a generic problem with the Samsung hard disk developing bad sectors. However, the three-year warranty provides a

good platform." Seagate was held back on this front with complaints of "One-year warranty not a sufficient time period", or "product is good, but not enough warranty". As one Devinder Singh echoes, "A three-year warranty given by a company assures reliability of its product. A consumer then looks for a quality product instead of seeking after-purchase services from the company."

Our readers also expressed dissatisfaction with the after-sales service offered by Seagate, once the warranty expires. As Prakash Dugar, a chartered accountant,

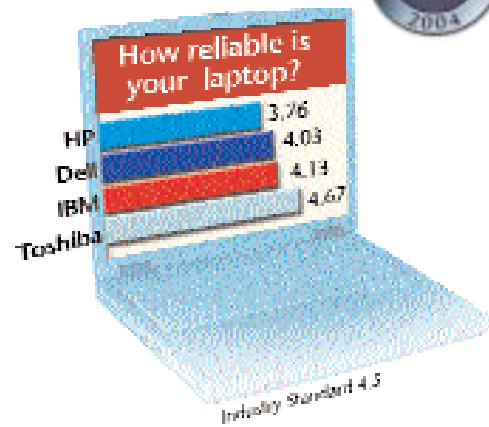
claims, "Beyond the warranty period of one year, Seagate provides no service support, one has to simply throw away the product and buy a new one." A charge supported by Pratima Sawe a computer consultant: "When the hard disk stops working after the warranty period expires, Seagate refuses to give repair support. The company should undertake repairs and charge for it." Samsung is not without sin in this regard as one particular reader pointed out that "Whenever I call a service centre, they tell me to call after 10 to 15 days".

A **Seagate** hard disk was owned longer than a **Samsung**, and needed a greater amount of servicing in a **two-year** period

MOST RELIABLE HARD DISKS: Samsung RUNNER-UP: Seagate
 MOST SATISFACTORY SERVICE: Samsung RUNNER-UP: Seagate

Laptops

Winner for laptops is **TOSHIBA**



The woe of most desktop computers users is the fact that the tool of their trade and entertainment is no symbol of reliability. Its portable counter-part—the laptop—can be safely considered a bonsai version of the desktop behemoths. Logically thus, one could surmise that laptops would also suffer the family curse of mal-reliance and instability. However, we learned, with humility, that one can only stretch logic this far, before it comes snapping

back, reality in tow. Based on our consumer survey, we found that laptops did pretty well indeed, both in terms of reliability and overall service. A part of this could be because only 170 responses were logged for this section; only MP3 players had smaller representation. Nevertheless, everyone responding was pretty happy with their purchases—solutions from HP, Dell, IBM and Toshiba—in terms of perform-

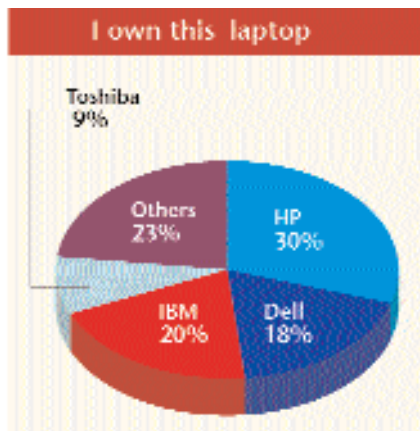
“ What I am really impressed by is the speed at which these buggers work ”



Hiten Sampat, on his IBM laptop
 Mumbai, Maharashtra

tle surprise when the manufacturer Dell scored the highest on our Service Index for laptops.

A surprise was, however, sprung by Toshiba: this particular company seems to enjoy a good rapport with its laptop users. One particular IT professional was

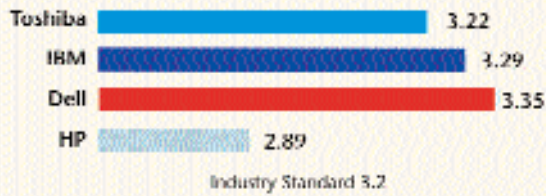


ance of their machines, their reliability and the after-sales support provided by their manufacturers.

Arvind Krishnan, who would only identify himself as an administrator, was particularly upbeat about his Dell laptop, pointing out that they offer, "very good after-sales service. A faulty part was replaced within 24 hours, even though the part had to come over from Bangalore." Jyoti Chakravartty supports his case and Dell's by saying, "The service was prompt and the person from Dell was really friendly." With similar responses across the board, it came as lit-

Dell's technical staff came up on **top**, whereas **HP's** did the **worst**. Respondents were **most** satisfied with **IBM** when it came to repair or replacement of their unit

How satisfied are you with the service?



Yes, I would buy from this company again



so impressed with his Toshiba laptop that he helped procure four more machines within a span of three months for his company.

The much applauded Toshiba was not without its share of problems—Alec Pinto, who works as a technical support person says, “The screen of my laptop stopped

responding. I believe this is a standard problem with the Satellite Pro 6100 model. Toshiba repaired it on an international warranty.”

Toshiba however topped the charts with the highest score on laptop reliability, IBM coming in at a close second. HP disappointed its customers on both counts, the reliability of its laptops and the customer satisfaction of its particular products; scoring the lowest on both counts and bringing up the rear in this 4-player race.

MOST RELIABLE LAPTOP: Toshiba RUNNER-UP: IBM
 MOST SATISFACTORY SERVICE: Dell RUNNER-UP: IBM

MP3 Players

Winner for MP3 players is **PHILIPS**



‘It’s a Sony’. As a systems engineer pointed out, “the name says it all”, a fact borne out by the results of our survey for the category of MP3 players. While the segment saw votes for Sony, Creative, Samsung, Philips and Mercury, among others; the percentage of

that of any segment. Of which, Sony picked up a healthy 31, while both Samsung and Philips took 20 apiece.

That the name Sony commands respect in the market of consumer electronics was highlighted by feedback such as “Sony is the best, always”, “...good performance” and even “I trust Sony, though their support is awful.” Indeed it was pointed out

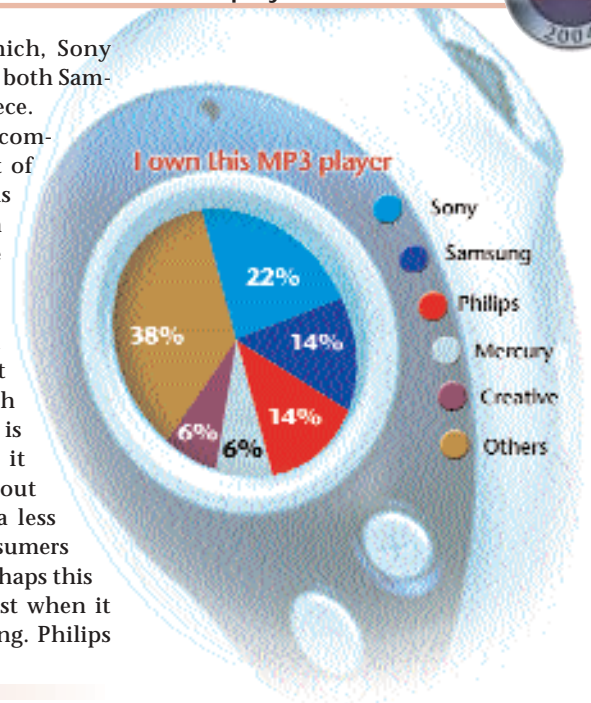
How reliable is your MP3 player?



votes gathered by Sony, Samsung and Philips pushed everyone else out of the ring and out of the reckoning.

At a count of 142, the total votes filed for MP3 players were lower than

that Sony India is offering a less than stellar service to its consumers and that it mend its ways. Perhaps this is why Sony scored the lowest when it came to quick problem solving. Philips



“ The best piece that one can own. Superb performance, no maintenance and good service ”

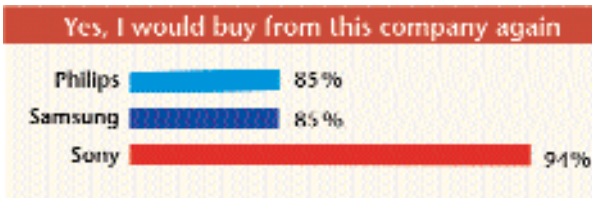
Pratik Dutt, on his Philips MP3 player
 Vapi, Gujarat

How satisfied are you with the service?



beat Sony as its technical team was perceived to be better. Hence, there was greater satisfaction with Philips' repaired or replaced products. Philips took away the crown as

According to our survey, a **Philips** MP3 player required the least amount of servicing in a **two-year** period, followed by **Samsung**, which was also owned the longest



far as product satisfaction was concerned. Sony scraped the bottom of the barrel, but it scored the highest percentile points, with 94 per cent of respondents saying that they will buy a Sony product again. Apart from mind-

share the company also earned top marks in the Reliability Index beating out Samsung and Philips by a decent margin (the latter two had a close fight, with Samsung edg-

ing out Philips.

Samsung was criticised for its low-quality solutions by more than one

reader saying, "audio output quality not so good" and "the product is not up to the claim of the manufacturer, the service is absolutely nil." Suneel Mohan, a Yepp player user, claimed that "Yepp jumps audio tracks sometimes... when I asked the service station personnel they said that it's a common problem and that a replacement would take at least three months."

MOST RELIABLE MP3 PLAYER: Sony RUNNER-UP: Samsung
 MOST SATISFACTORY SERVICE: Philips RUNNER-UP: Samsung

Printers

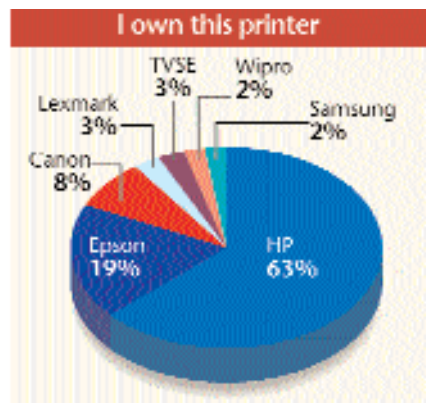
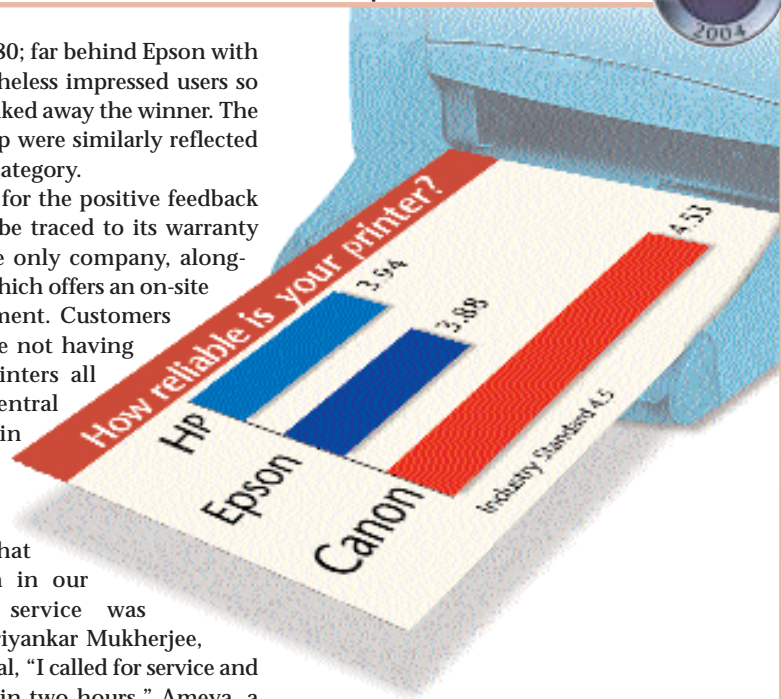
Winner for printers is **CANON**



The sheer number of HP service centre is legion. Theoretically, their reach should address even the most remote Indian. Unfortunately, given the size and the diversity of the Indian market, it is not uncommon to run across cases like that of Suvidha Agarwal who says, "HP offers good reliable products, but it should open service centres in places like Kashipur in Uttaranchal." Suvidha further states that

tant third with 80; far behind Epson with 187, but nevertheless impressed users so much that it walked away the winner. The results and setup were similarly reflected in the scanner category.

One reason for the positive feedback for Canon can be traced to its warranty service. It is the only company, alongside Lexmark, which offers an on-site printer replacement. Customers really appreciate not having to lug their printers all the way to a central service station in case something goes wrong; an appreciation that shines through in our survey. "The service was superb," says Priyankar Mukherjee, an IT professional, "I called for service and they came within two hours." Ameya, a student changed brands and is happy



lowering their prices, as an HP user, Vidhyadhish Desai, a hardware technician from Mumbai, put it, "Great printers! Only the prices for cartridges should be lowered." The cost of cartridges sees consumers go in for refilling, something that Kreisler Drego advises against: "HP print-

Great company, great product

Siddharth Shah, on his Canon printer
 Valsad, Gujarat

she has to go to local vendors to get her problems solved.

While HP certainly commands a huge market share of printers and scanners, it loses out to Canon in both these segments on the basis of both product reliability and service. Printers got a whopping 1006 votes in our survey, and HP bit off 638 of that number. Canon came in a dis-

with his decision, "I used Epson prior to Canon, and was disappointed! No service at all." Another satisfied customer, Sethukumar S, a government employee, said that he "never faced any problem. The Canon printer is doing well."

A common grouse of consumers was the high cost associated with new cartridges, many a respondent suggested

Respondents owned **Epson printers** for the longest time and required the least amount of servicing in a **two-year** period



ers work well as long as the print cartridge used is genuine, and not refilled. When the cartridge is refilled, the printer goes kaput!” He goes on to point that “HP very clearly states that refills are not tolerated by their printer—using genuine cartridges, my printer is now in its seventh year.” One

particular user of an Epson printer, Sameer Bhargava from New Delhi, opines that “it is good that third-party ink cartridges are available which lowers the running cost.” Alongside cost of cartridges, drying up of ink is also a source of worry for most users. As Jayesh Mehta, a businessman from Mumbai points out, using his Canon printer as an example, “There is a major problem of cartridges drying up, if the printer is not in continuous use.”

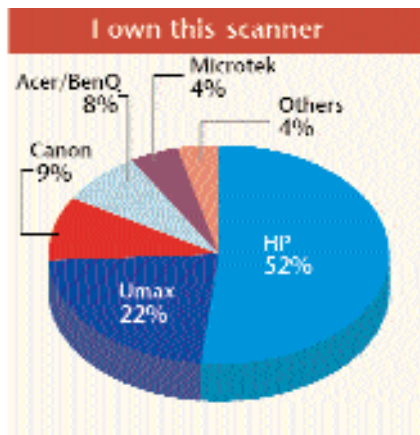
MOST RELIABLE PRINTER: Canon RUNNER-UP: HP
 MOST SATISFACTORY SERVICE: Canon RUNNER-UP: HP

Scanners

Winner for scanners is **CANON**



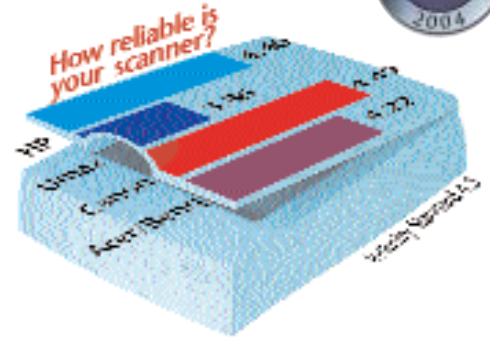
Not so long ago, a printer and a scanner were considered expensive accessories to a computer. Over time, however, reduction in prices have brought them within the easy reach of one-and-all, and both these devices find greater usage in homes and offices.



this category, followed by UMAX and Canon. With their large number of service centres strewn all over India, “Service most widely and promptly available”, is a common chant amongst users of HP. HP customers, therefore, are generally happy with their products.

However, HP’s technical support is not as good as Canon’s : with feedback such as “Very little help from the technical persons”, Canon steals the carpet from under HP when it comes to service. Indeed, praise for Canon is ubiquitous with hardly a negative comment in its name. From “Very handy and good scanner”, “very good for home usage”, “best scanner”, “Canon has kept its mark”, to “best company for scanners”, Canon seems to have captured the hearts of its customers.

One of the reasons for such a stellar showing could be alluded to the fact that



this company’s doorstep. Anish Gangar, an online content writer complained that “My UMAX 3400U scanner started giving problems within a year, and is still lying dead on my computer table. UMAX is the worst company, and I do not recommend my friends or colleagues to go in for UMAX products.”

Jaideep Khanduja an IT professional claims that his UMAX 2000 scans even a white page with a green background. Pratima Sawe, a computer consultant from Mumbai, was asked to replace

// A product worth the money //

Nikhil Kumar Desai, on his Canon scanner
 Hyderabad, Andhra Pradesh

So much so that, one can now opt for an all-in-one device at the same price a printer or a scanner would have commanded a few months back.

The devices are so interlinked that their manufacturers make appearances under both the categories, you will find that HP is as synonymous to scanning or printing as Xerox is to copiers. HP commands the largest chunk of votes under

Canon has an on-site replacement warranty—you do not have to leave your home or office in case something goes wrong with your scanner. Canon does equally well as a reliable scanner. It wins the highest score for both the Reliability and the Service Indices.

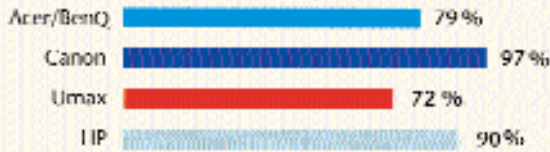
Umax scanners got quite a beating—everything from bad-quality scans to bad service to faulty lamps were placed on

Customers of **Canon** recorded the most satisfaction with repaired or replaced **scanner**, were most happy with the technical support offered and their problems were **solved** the **quickest**

How satisfied are you with the service?



Yes, I would buy from this company again



rather than repair her UMAX scanner, she says, "Its light needed to be changed and the service centre said it would be less expensive to give it up and buy a newer USB scanner." Nikhil Joshi a multimedia co-ordinator, says, "No and never to UMAX even if it is offered free. Worst company, worst product and horrible service support."

Small surprise that UMAX scored the lowest on the Reliability Index in our consumer survey.

The quality of glass used in BenQ scanners was a source of complaint. Kreisler Drego mentioned that, "the glass used in the BenQ scanners are of a very poor quality making it difficult for the cathode lamp to shed light on the image being scanned. Each service was worse than the previous, especially as far as replacement of the glass was concerned." BenQ scored the lowest on the Service Index.

MOST RELIABLE SCANNER: CANON RUNNER-UP: HP
 MOST SATISFACTORY SERVICE: CANON RUNNER-UP: HP

Sound Cards

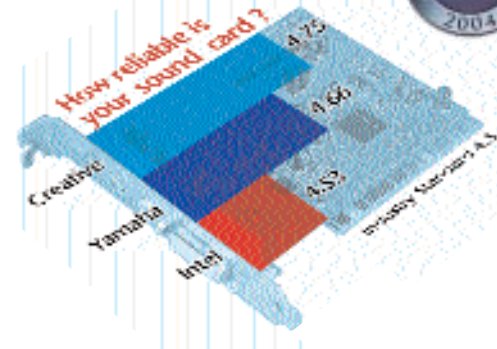
Winner for sound cards is **INTEL**



As a company, Creative equals sound cards. Its products have engineered sound on the PC right from the days of the mono-coloured DOS prompt, up to the kaleidoscopic million-coloured screens of today. And in keeping up with the big-bang in colours, the company has enabled an explosion in sound from the mono-channels of bygone to the 7-channel band that plays on a PC near you. Remember however, a shadier aspect of those days—the hunt for the right driver, the tweaking with the DMAs and the IRQs, the fiddling with those tiny jumpers to get the little buggers to sing a song of 16-bit. A walk through this section should

bring those memories rushing back. Things are not the same of course, but users are humming a familiar tune of software woes, driver problems and hardware conflicts...

To begin with, the survey confirmed the absolute dominance of Creative products in the field of soundcards. Of a healthy 296 that responded under this category, an overwhelming 225 had Creative solutions nestled within their systems. Yamaha came a distant second with 40, while Intel huffed and puffed with only 19 entries. Yamaha cards were, not surprisingly, the oldest of the bunch, followed by Creative. Note that Intel here represents the onboard solution

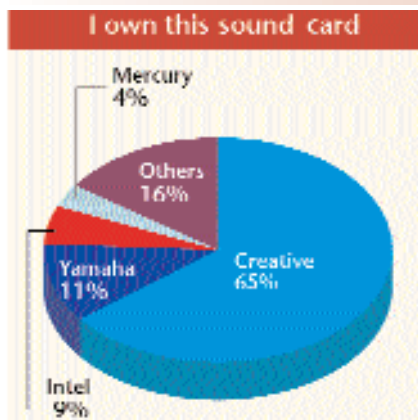


when it comes to sound cards..." Creative won as far as reliability of products was concerned, but niggling hardware problems experience by a percentage of respondents, along with the fact that the problem was seldom unsolved, meant that the company scored the lowest in service. So Yamaha came in second and Intel stole the top.

Hardware compatibility problems, ranging from "compatibility issues with my new MSI KT6 Delta motherboard and Pinnacle Studio 8 software", to, "it interferes with the TV reception if I have a TV-tuner card on the motherboard", coupled with driver woes "they should get some real coders to make their drivers, their

// Bhagwan in the field //

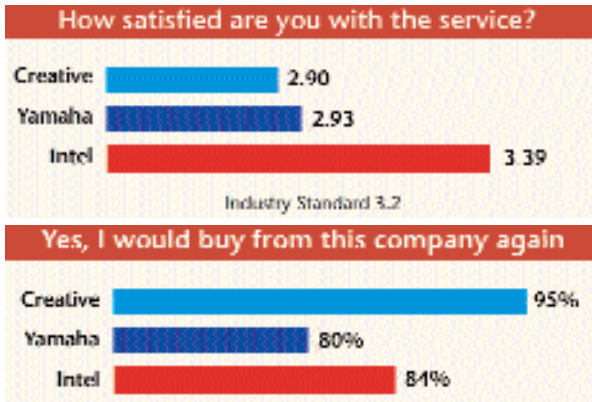
Rahul Mundra, on Creative sound cards
 Gujarat



found on motherboards, not a stand-alone card. With that in mind, it comes as no surprise to find Intel solutions requiring the least service within a two-year period. Yamaha cards did not fare too well in this aspect, coming in at the third place by quite a margin.

Creative scored highly on the Reliability Index, a fact corroborated by readers such as long-time user Prosenjit Sarkar from Kolkatta, "My old PC has a Creative Sound Blaster Live, and it has been running for over seven years now. I have a very high opinion of Creative products

Intel solutions were not only **reliable**, problems related to them were also solved the most **quickly**



drivers are a friggig joke"; led some people to declare rather unflattering things about Creative's offerings. One Dinesh Goyal, a businessman is especially vitriolic, "I feel like a fool having spent so much money for a piece of s***!" Meanwhile, a reader in Chennai, Prakash

Dugar, a chartered accountant, wonders if he will ever get support for Creative's products in his state. While Yamaha comes across as a more stable solution (keeping in mind its share of votes), it too faces driver problems, especially under newer operating systems: "performance is satisfactory, but the Web site does not have drivers for all products under Windows XP," complains Abhishek Malhotra, from New Delhi.

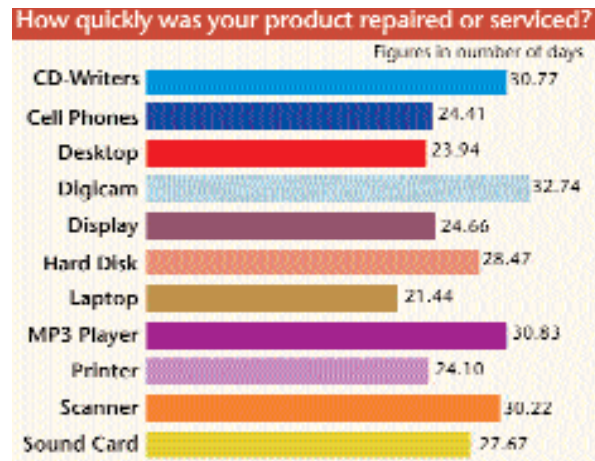
MOST RELIABLE SOUND CARD: Creative RUNNER-UP: Yamaha
 MOST RELIABLE SERVICE: Intel RUNNER-UP Yamaha

Final Thoughts

The survey threw up some interesting numbers. Take desktop computers: the segment charted a Reliability Index of 3.63, the lowest across all categories, as opposed to the industry standard of 4.50. It repeated the offence under the Service Index as well, which transforms this product category into the most-troublesome device in the industry. This is quite a disappointing showing, considering that a PC is the primary means of work, communication and is an industry driver. Little wonder that corporations spend more on servicing and maintenance of their systems than on procurement of the same. Initiatives such as the grid-enabled Autonomic Computing—wherein the mantra of self-healing, self-aware, self-protecting, self-configuring and self-optimising computers is repeatedly chanted with the hope of attaining computing nirvana—promise hope but only time will tell if they will deliver.

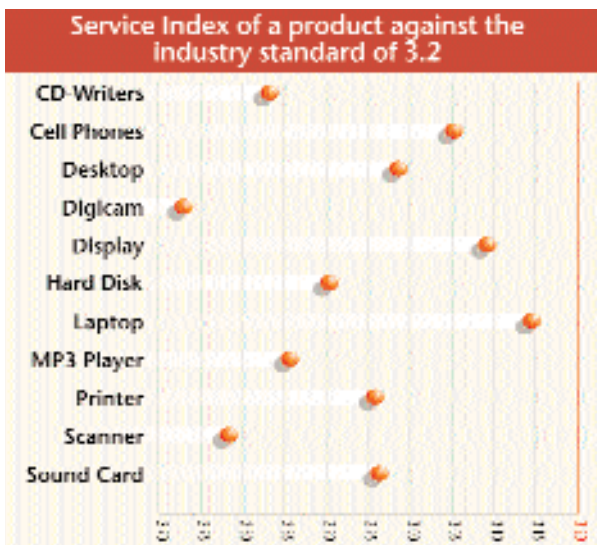
Another point to note is that products which did not score well on the Reliability

and Service Index had very positive perceptions in the minds of consumers. This dichotomy between fact and perception can be traced to the strength of the particular brand. Sony, for example, seems to be especially blessed in this regard. With comments such as "The name says it all," Sony is sitting pretty in the mind-space of consumers. For digital cameras, 98 per cent of respondents claimed that they would buy a Sony again, note however that in that category, Nikon did the best in both the Reliability and the Service Index (87 per cent of the 169 respondents would buy a Nikon again). Is a Nikon owner wondering whether a different company would offer him or her, a better product or a better service? A case of the grass is greener on

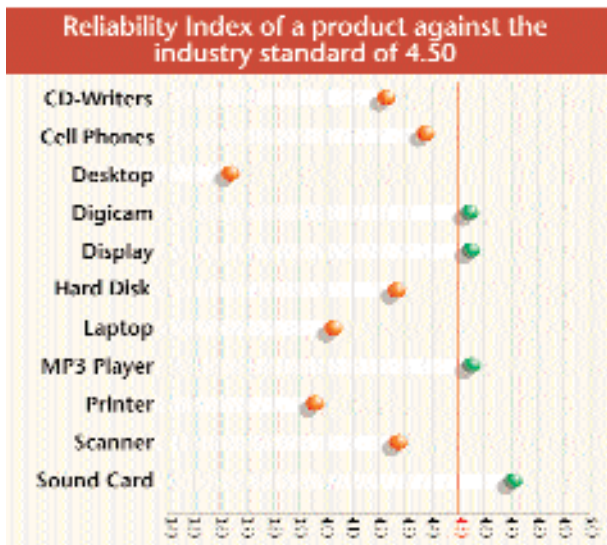


the other side or of branding, or both? Support and service, both technical and personal, are important facets of a purchase. We hope this survey has served its purpose of throwing light on the after-sale corner of technology.

AHMED SHAIKH
 ahmed_shaikh@thinkdigit.com



MOST TROUBLESOME DEVICE : **Desktop computer**
 MOST TROUBLE-FREE DEVICE: **Sound Card**



At your service

We chatted with ASUS, Lexmark, Epson and Philips to find out what they're offering in terms of after-sales service and assistance.

What initiatives have you taken in the service space?

ASUS: Currently, our distributors provide services. As vendors we support our distributors in terms of providing spares, training and education, equipments facilities and regular monitoring by our HQ - Taiwan team

LEXMARK: We have LexExpress, a door-to-door replacement service. Across major cities, Lexmark's service engineers personally visit a client and try and solve the problem. If the problem is not resolved in that one visit, a replacement unit is provided. LexExpress is a free service under the warranty period.

EPSON: We have increased the frequency of refresher trainings, and increased the number of warehouses to reduce the transportation TAT (turn-around-time).

PHILIPS: We are the first company to introduce a swap warranty for monitors, which effectively means almost zero downtime. Moreover, we have a commitment to repair or replace a monitor within 24 hrs. Further, we are in the process of setting up exclusive IT service personnel in all major cities.

Do your service centres cover all the major regions in India?

ASUS: Yes, more than 30 cities are covered through our distributor network

LEXMARK: Yes, we have 55 service centres in 51 cities

EPSON: Yes, presently we have 151 service centres, spread across 75 Cities

PHILIPS: Yes, we have 196 Authorised Service Providers (ASPs) and 18 branches

What are the technical qualifications of the personnel that work in your service centres?

ASUS: The company headquarters at Taiwan conducts training sessions, and provides support in terms of equipments and spares.

ASUS engineers from Taiwan also visit frequently to monitor the progress.

LEXMARK: Diploma Engineers or ITI (Indian Technical Institute) qualified

EPSON: Diploma Engineers or ITIs

PHILIPS: All service engineers are Graduates engineers and have assistants under them

On an average, how quickly is a technical/support query resolved by your call centre personnel?

LEXMARK: Statistics show that 40 per cent of the complaints are resolved over phone.

EPSON: Within 5 Minutes, and in case it cannot be resolved, it is forwarded to the technical support group

PHILIPS: Over the phone, else on the visit within 24 hrs

The following images present a behind-the-scenes look at the workings of a call centre.

Images are courtesy of Lexmark International (India) Ltd

A caller (a) was put on hold for 42 seconds (b), after which he or she abandoned the call

A caller (c) was put on hold for 38 seconds, after which the call was taken by the service centre personnel (d)

There were a total of six calls in this time interval (a), which were handled by three technical personnel (b), while three more were available to take additional calls (c). The average time a customer had to hold the line was 10 seconds (d), while a call was cleared in a little over 3 minutes on average (e). All calls were answered, translating into a Service Level of 100 per cent.

Time of Day	Queue Size		Avg Queue Time		Longest Queue Time		Queued Calls
	Maximum (min)	Longest (min)	Answered (minutes)	Abandoned (minutes)	Answered (minutes)	Abandoned (minutes)	
11:30 PM - 11:59 PM	0	0	00:00:00	00:00:00	00:00:00	00:00:00	0
01:00 PM - 01:30 PM	3	1	00:00:00	00:00:00	00:00:00	00:00:00	2
01:30 PM - 02:00 PM	3	2	00:00:00	00:00:00	00:00:00	00:00:00	0
02:00 PM - 02:30 PM	4	0	00:00:00	00:00:00	00:00:00	00:00:00	1
02:30 PM - 03:00 PM	3	0	00:00:00	00:00:00	00:00:00	00:00:00	0
03:00 PM - 03:30 PM	3	0	00:00:00	00:00:00	00:00:00	00:00:00	0
Total	-	-	-	-	-	-	4
Average	-	-	00:00:00	00:00:00	-	-	0

Time of Day	Number of Calls		Average Time		Number of Members		Number of Members		Service Level (%)
	Offered (min)	Answered (min)	Wait (minutes)	Handling (minutes)	Logged On (min)	Ready (min)	Logged On (min)	Ready (min)	
11:00 AM - 11:30 AM	2	2	00:00:10	00:00:46	3	3	3	3	100.00
11:30 AM - 12:00 PM	4	4	00:00:09	00:01:18	3	3	3	3	100.00
12:00 PM - 12:30 PM	3	3	00:00:09	00:00:53	3	3	3	3	100.00

LEX EXPRESS SERVICE

CUSTOMER INFORMATION

Incident ID: 9992 Incident date: 1/5/2003

Customer ID: 9997 Customer Name: Suraj

Address: [Redacted]

Country: [Redacted] Email: [Redacted]

Postal Code: 03 Telephone: [Redacted]

Reported By: Adesh R Fax: [Redacted]

Delivery Address: [Redacted]

Problem Description

Problem: Photo Printer Allow (lighter Discoloring) as soon as the printer is switched on. 1/5/2003 11:51:14 PM. [Redacted]

Chargeable: [Redacted]

WARRANTY INFORMATION

Serial No: 0538053879 Product Name: 5400i/5400i/5400i

Part No: 1182015 Model Name: 5400i

Customer information (a), the problem itself (b) and the warranty detail is some of the information LexExpress stores to help connect a customer's query to service personnel. A service centre (in each of the cities covered) can log on to such a Web site to take up and solve customer complaints

How we Test



It looks good and the technology is glitzy, but does it do the job?

To ensure that our readers have all the information they need to make an informed buying decision, reviewers at the Digit Test Centre conduct comprehensive tests to evaluate the latest hardware, software and technology services in accordance with international standard evaluation processes and methodologies.

Our test results may be presented either as Comparison Tests, or as individual reviews in the Bazaar section. The representation of the results is different for each in the interests of clarity, but the test process for both is identical in all respects.

Of all the products we test, only the best make it to the A-List.

Comparison Tests

In the comparison tests, we compare the performance of products within a particular category. Each product is evaluated under different parameters such as performance, value for money, features, ergonomics, etc.

Weightages are then applied to the various test parameters according to their importance for that particular category of products. These weightages are then used to arrive at scores for features, ergonomics and performance for each individual product. A detailed test process is included with each comparison test, and explains the parameters that were taken into consideration, along with weightage allocation and reasons for the same.

In Bazaar

The evaluation of products in Bazaar also covers the same parameters such as performance, ease of use, value for money, build quality and features of the product.

Here, each of these parameters is rated on a scale of 5, which is represented by arrows (->).

The greater the number of arrows, the better the product. This simple five-point rating system is designed to give you an easy-to-interpret assessment of a product. For example, a product that

receives a value for money score of five arrows signifies an outstanding buy.

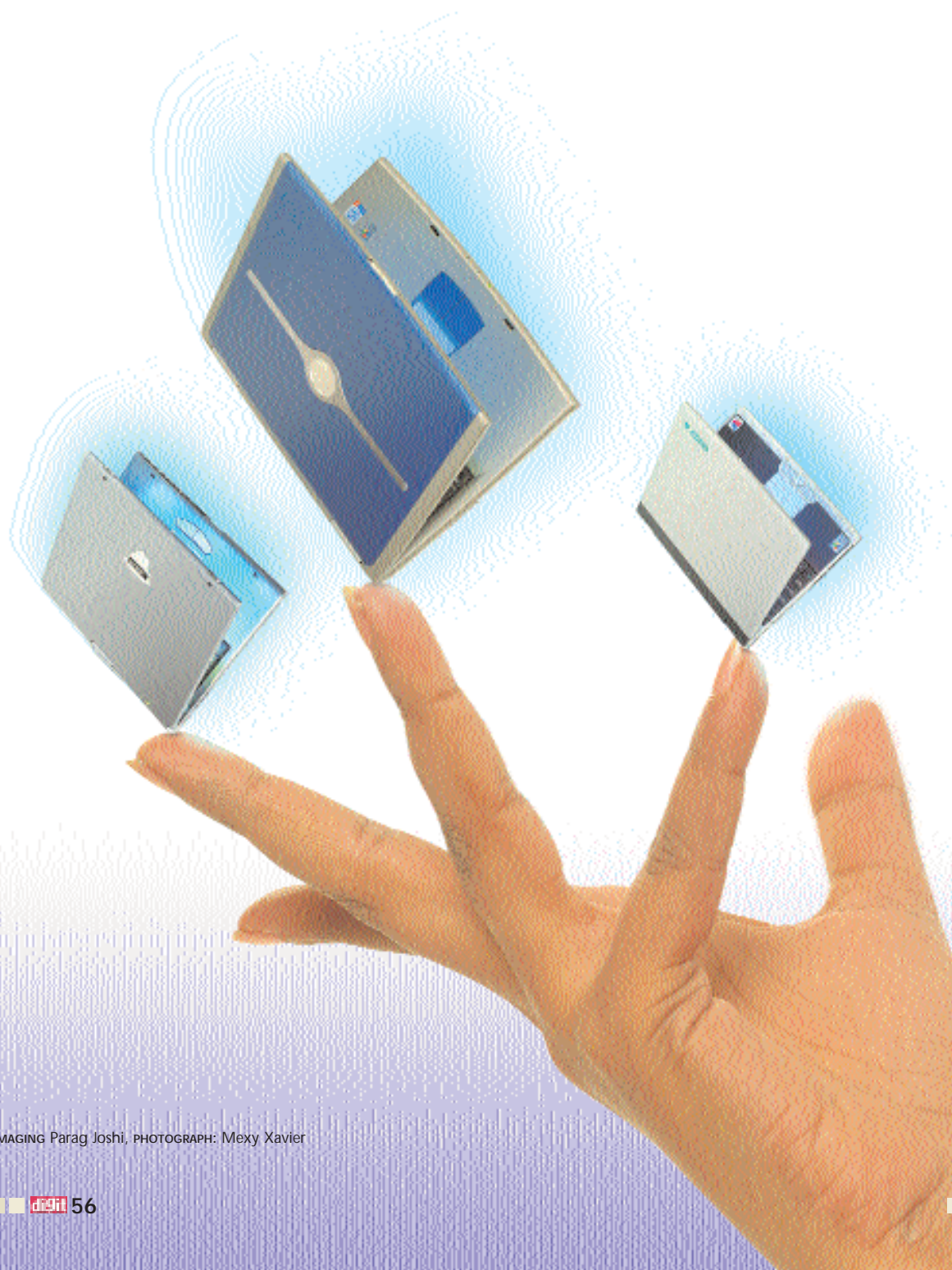


The Awards

Digit awards outstanding products by selecting a Best Performance and Best Value winner in each comparison test. The winner of the Best Performance Award will be the product that scored the highest in the performance segment combined with rest of the package including features, ergonomics, bundled accessories etc. This award represents the best performing product in our tests in terms of the complete package that is offered to a customer. The winner of the Best Value Award will be the product that scores the highest in our value for money parameter which is derived taking into account the ratio of a product's ergonomics, performance and features to its price. The product winning this award offers a good combination of performance and features at a great price. Since value for money takes into account all scores for all parameters including the price, this score will be used to arrive at a grade (e.g. A+) for each product.

The 5-point Rating System used in Bazaar	
▶▶▶▶▶	Excellent: A brilliant combination of price, performance and features—far beyond expectations
▶▶▶▶▶	Good: A good buy, better than most products in its category
▶▶▶▶▶	Average: Reasonably competent but nothing spectacular about the product
▶▶▶▶▶	Mediocre: Does not live up to expectations, needs improvement in many areas
▶▶▶▶▶	Poor: has serious drawbacks and needs improvement before it can be used for its target application

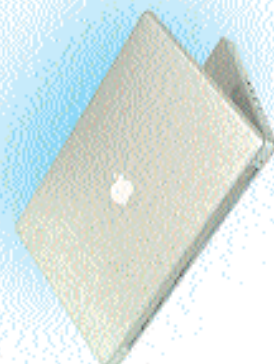
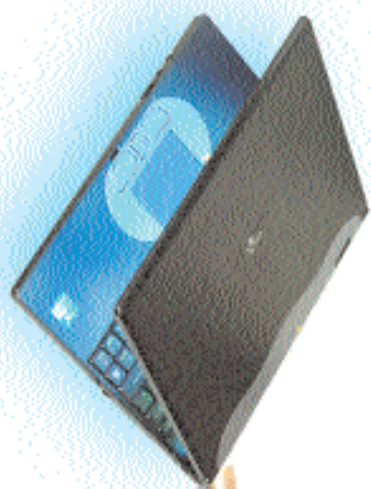
LAPS OF LU



IMAGING Parag Joshi, PHOTOGRAPH: Mexy Xavier

XURY

21 laptops vie for for space on your lap, to make sure you know exactly what to buy, depending on your budget and your needs. Read on to find that perfect mobile mate



Recently, an organisation was in the news for offering notebooks to a majority of their employees. While to most people, this may seem like another example of corporate indulgence, there is in fact, calculated economics behind the move. A normal office PC costs anywhere around Rs 35,000, whereas an entry-level laptop costs at least twice as much. By giving the employee, the employer is assured of work being done anywhere—be it in transit or at home—beyond the normal working hours. The place simply doesn't matter. As long as the employee has the device with him or her, he or she will work. On the other hand, deployment costs in terms of networking are reduced, and less desk space is used. Recently, many Indian business schools made it mandatory for their students to have a laptop before they enrol themselves for the course.

The world is going mobile in the true sense. Despite the

availability of laptops, the acceptance rate in India is far less as compared to the West or, for that matter, our neighbouring Eastern countries. The recent move by many established international vendors such as IBM, Acer and HP to provide entry-level laptops below Rs 50,000 will further increase the growth in this segment.

Coming back to our comparison tests, we did our best to cover as many products from different vendors. Reputed international brands such as IBM, HP Compaq, Toshiba, Fujitsu and Acer took part in the comparison. We also included many Indian-based manufactures such as ACi, Micro-D, BP—with its distinct looking models—and the newly launched PnP. We managed to get one laptop from Wipro's peripheral division, and of course, Zenith. Dell only managed to send in one laptop, the Inspiron 1100. We did not include Sony's VAIO range since it did not have any authorised Indian vendor.



How We Tested

Laptops were assessed on four main parameters—features, performance, usability and package content. Their weightages varied from one category to another. The features weightage remained constant at 35 per cent across all categories, but as each category has different requirements, each individual feature had varied weightage across categories.

We used Windows XP as the standard operating system. Each laptop was formatted, and a fresh copy of Windows XP professional was installed. After the installation, all the latest drivers were loaded, without any manufacturer provided tools or customised software. All Tablet PCs were tested on Windows XP Tablet edition. For the temperature test, we used a thermistor-based thermometer to note the temperatures. The ambient temperature was kept constant at 26 degrees Celsius, before commencing the test. The laptops were weighed on an electronic scale for accurate weight measurement.

Features

Features are of key importance to laptops, as they act as the sole differentiators between models. Physical features were not considered under this parameter, but were assessed under usability. We noted various features such as the type of RAM, hard disk capacity and speed, type of optical drive provided, types of ports, connectivity options, etc. Each of these was then scored according to the importance they played in the category the laptop was placed in. Processor speeds and amount of memory were not given any weightage as the extra speeds should be reflected in the performance tests.

Usability

A laptop's usability is evaluated on the basis of how simple or difficult it is to handle in day to day life—whether it has shortcut keys, its weight, etc. We also subjectively weighed the build-quality—three different people were asked to rate the build quality on a scale of five, and the average was calculated. A similar exercise was used to rate the overall ergonomics of the laptop.

To assess the speaker quality, we played music files that encompassed the complete audio frequency range. Based on the perceived output, we rated them on a scale of one to five. Since laptops are mobile work companions, it is essential to log the maximum heat dissipated by them. We ran a movie for 20 minutes to

simulate the high activity scenario, and noted the temperature on the under belly of the laptop.

Package contents

We noted whether the vendor provided the operating system with the laptop; whether they bundle a recovery CD, users manual and driver CDs. We also noted the extra software provided, and the accessories—power adapter, carry case, etc.—bundled along.

Performance

To gauge the performance of each laptop, we ran a battery of tests to evaluate each individual sub-system. The following benchmarking suites were used to test the laptops:

Si Soft Sandra 2003 professional: This benchmarking suite was used to evaluate CPU, memory and hard disk performances. The CPU benchmark gives us the arithmetic and multimedia scores for a particular CPU. The hard disk benchmark yields sequential read, sequential write, random read and random write speeds of a hard disk, as well as an estimated access time.

Ziff Davis Business Winstone 2002: ZD bench's Business Winstone offers an excellent way of evaluating the complete system performance, and returns a unified score that is an aggregate of the individual tests—the higher the score, the better the system performance. This benchmark suits the purpose because it tests a system using applications that are used on a daily basis; it simulates real world usage to arrive at the final score, which reflects how the system will fare under real life loads.

Video Encoding: We encoded a 50 MB video file using Virtual Dub to convert an MPEG file to DIVX. The codec used for compression was DIVX 4. The time taken to compress the file was noted—the faster the CPU and memory subsystem, the faster the encoding of the file.

Quake III: Arena and 3D Mark 2001 SE: As most of these systems come with low-end graphics adapters, using heavy graphic benchmarking tools doesn't make much sense. We relied on *Quake III: Arena* to test the graphics performance, and logged the frame rates at different settings. We also used 3Dmark 2001 SE to further assess the graphics capabilities.

MobileMark 2002: We used MobileMark to evaluate the battery life, which simulates real world usage. It drains the battery from 100 per cent until the system cannot handle the load anymore,

MAINSTREAM NOTEBOOKS

Mainstream category laptops are budget laptops that offer you mobility and decent performance while working with MS Office, Internet, etc. However, they are no firecrackers when it comes to setting speed records. Though similar to the thin and light notebooks, they differ in the sense that they are heavier, and do not offer great features and a long battery life. These mainstream notebooks weigh around 3 to 3.5 Kgs and are 28 to 30 mm thick. Consider yourself lucky if you get a combo-drive with these models, since CD-ROMs or DVD-ROMs usually accompany them. Similarly, a 20 to 40 GB hard drive is the normal storage capacity. Though 14-

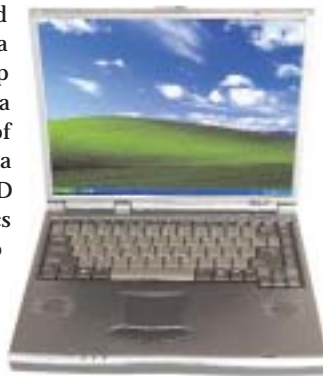
inch TFT LCDs are a standard, certain high-end laptops might offer a 15-inch LCD.

Legacy ports such as parallel and serial may be present. High-end models offer at least two USB ports along with Firewire ports. Most of the mainstream laptops have spruced up configurations, and 256 MB of RAM is a standard fitment. Hence, using Windows XP is not much of a problem. Keep your minimum requirements in mind while buying a mainstream laptop. Pick a model that offers the maximum number of features at a decent price. Do remember to check its weight, as that's what you're going to have to carry.

ACi Ethos4

Run of the mill

The ACi Ethos4 is targeted solely at those in need of a decent performing laptop at an affordable price. It has a Pentium4 M 1.8 GHz, 256 MB of DDR RAM, a 40 GB hard drive, a CD-ROM drive, a 14-inch LCD display and a SiS 650 graphics chipset. Also provided are two USB ports, a parallel port and one Firewire port.



Excessive use of dull plastic elements coupled with a dated design gives it a boring character. The keyboard layout is cramped, but the keys provide good tactile feedback. The touchpad is sensitive and accurate, but the entrenched buttons should have been raised a little. The speakers are placed near the palm rest, thus affecting the sound quality. The top lid is locked at both ends, and needs a single slider to open.

Ethos4 had the lowest performance scores in this category. The memory scores were below par, indicating the bottleneck in the memory subsection. The hard disk also returned below average scores. As a result, its overall system performance plummeted—it returned just 19 units in the Business Winstone test. This means that opening multiple Excel sheets, Word documents and Outlook simultaneously will stress the system. Ethos4 logged an average temperature of about 38 degrees, doing better than its other ACi counterpart.

Ethos4 is a good option for those on a shoestring budget. If you can spend Rs 15,000 rupees more, then the nx9005 is a better choice with its elegant business look and decent performance.

Price: Rs 54,990
 + Good hardware configuration for the price
 - Dated design

ACi Ethos4	B
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

ACi Optima

Optimum configuration

Despite a Centrino platform, the ACi Optima landed with the mainstream laptops due to its weight and dimensions.



The Optima comes with the Pentium M 1.7 GHz, 512 MB of DDR RAM, a 15-inch LCD screen and a 60 GB hard disk. It was the only laptop that had a DVD-RW. It has three USB ports and one Firewire port; wireless capability is offered via an Intel wireless card. All this brings its weight to 3.1 Kgs, and makes it a few centimetres broader than a normal laptop.

The dull silver-grey finish makes it look cheap, and it is not as ergonomic as the Ultima; it lacks finesse and attention to detail. Placed on either side of the keyboard, the speakers sound too tinny. The touchpad is large and comfortable, and the buttons are raised for comfortable use.

The Business Winstone saw it return a terrific 29 units, just 10 less than the Ethos4. The memory scores were third best in the category. We tried in vain to test the hard disk as SiSoft Sandra kept hanging the machine. This is more likely to be a problem specific to the laptop we received. The batteries lasted for 3 hours, 16 minutes, which is quite normal for a Centrino laptop. Interestingly, its temperature never exceeded 37 degrees.

The Optima offers the latest hardware at an unbelievable Rs 90,000. Other laptops such as the Wipro Little Genius that are in the same price range, offer good performance but not the same configuration. Opt for it if you want a spruced up Centrino with cutting edge technology.

Price: Rs 89,990
 + Terrific performance, great features
 - Low aesthetic appeal

ACi Optima	C
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Dell Inspiron 1100

Inspired blue box

This metallic blue and silver-grey finished laptop from Dell comes second in the looks department, only because it was outdone by the beautiful looking HP laptops. Though the rounded contours spell panache, the design looks boxy. The build-quality is excellent, and it doesn't squeak when you press hard on it.

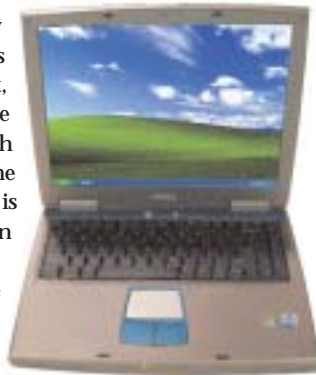
The Inspiron has a comfortable keyboard with a lot of space to rest your palms. The touchpad is small, but sensitive, and the large buttons are a boon, but lack tactile feedback.

Connectors that you'll use pretty often are placed at the back, and could cause some irritation as you'd have to change the laptop's, or your own position everytime you want to connect a USB device. The integrated speakers are simply useless.

In terms of features, this laptop was quite disappointing, and lacked serial and parallel connectors—the fact that it only provides two USB ports doesn't make up for it. It lost miserably to the HP Compaq models in this respect.

When it comes to performance, the Inspiron is no couch-potato. Its desktop processor has enough fire power to run most office applications smoothly. A point to remember is that the Inspiron 1100 base-model ships with 128 MB of RAM, but you can specifically ask for 256 MB, for an additional price; that's what we did. If you're going to buy this laptop, we strongly suggest the RAM upgrade for acceptable performance with Windows XP. The thermodynamics of this laptop are superb—even after running continuously for a day, the external surface was as cool as a cucumber.

Priced at Rs 79,969, the Inspiron 1100 is a good deal, but not if you're on the lookout for a feature rich laptop.



Dell Inspiron 1100 C	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 79,769
 + Great build quality and looks
 - Low on features

HP Compaq nx9000

A workhorse

The HP Compaq nx9000 has a metallic jet-black body, with attractive blue neon lights working as system status indicators. The keyboard is well spaced, with keys providing the right amount of tactile feel. It has a digital scroll that lets you go through a document simply by moving your finger over the area. Placed just above the touchpad, is the toggle switch that activates or de-activates it. This feature is very helpful since the cursor often gets displaced from its position when your fingers



unknowingly move over the touchpad.

Weighing 3.1 Kgs, the nx9000 comes with a Pentium4 M 2.2 GHz processor, 256 MB of DDR RAM, a 15-inch crisp TFT display, a 40 GB hard disk, and was the only laptop with a combo-drive. Windows XP, Norton Anti-virus and a handsome carry case are the freebies. Apart from an Ethernet and modem connector, it also offers wireless connectivity via an 802.11b wireless card.

It finished second after the ACi Optima in the performance category. In the CPU test, the processor performed well and returned good results. Its memory sub-system lost meekly; while the disk sub-system is the best. The battery lasted for around 3 hours on a normal load—quite good considering the nx9000's power-hungry components.

Priced at Rs 1,00,000, it's certainly expensive, but offers great build-quality, superb features and balanced performance. This laptop won the top honours for its good performance and unmatched feature list.

Price: Rs 1,10,000
 + Superb looks, good performance
 - Expensive

HP Compaq nx9000 C-	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

HP Compaq nx9005

Bridging the divide

The nx9005 was the only laptop in this comparison to ship with an AMD mobile processor.

The keyboard and the touchpad along with the activating and deactivating button, are similar to its Pentium sibling. The touchpad gels with the flat surface to give a neat and clean look. It has the same rugged, solid feel and dimensions as the nx9000.

Configuration-wise, it packs in an AMD Athlon M 2200+ with 256 MB of RAM. A 20 GB hard drive, a CD-ROM drive and the 14-inch display make the laptop more affordable. However, we strongly feel that a 40 GB hard disk should have been provided.

With the exception of the multimedia test, the AMD-powered laptop beat its Pentium counterpart in most of the CPU tests. One area where the nx9005 fared badly was the hard disk subsystem—it just could not keep up with the demand. The high access time and low scores was a clear sign of dated hard disk technology. Knowing that AMD processors are power hungry, the batteries surprised us by supplying power for nearly 3 hours. The laptop also did not show signs of heating up.

Considering its configuration, it is certainly expensive at Rs 70,000, but its sturdy build, good ergonomics and decent performance make up for that.

Price: Rs 70,000
 + Business looks, decent performance
 - Lacks features

HP Compaq nx9005 B+	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Jaguar M270S

Mobility for a pittance

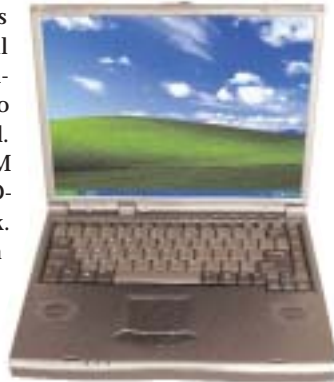
The Jaguar M270S clones the ACi Ethos4 in all aspects. The only distinguishing factor between the two is the colour of the plastic used.

It offers only a Pentium 4 M 1.7 GHz, 256 MB of RAM, a CD-ROM drive and 20 GB hard disk. The SiS 650 chipset provides an onboard graphics adapter. The small 13.3-inch TFT LCD was crisp and clear.

Looks-wise, the M270S is no different from the Ethos4, but the use of the colour brown, imparts some appeal. The keyboard layout is quite cramped, but the keys provide positive tactile feedback. The touchpad is sensitive and accurate, but the entrenched buttons are a pain to use.

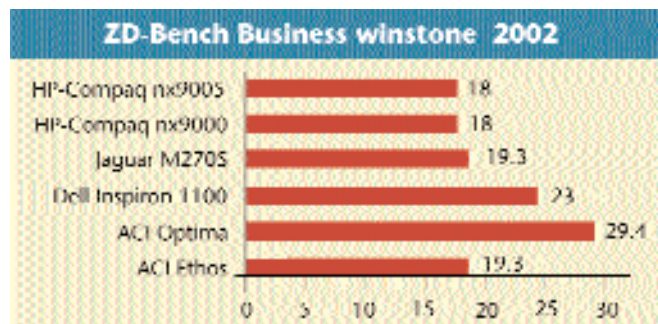
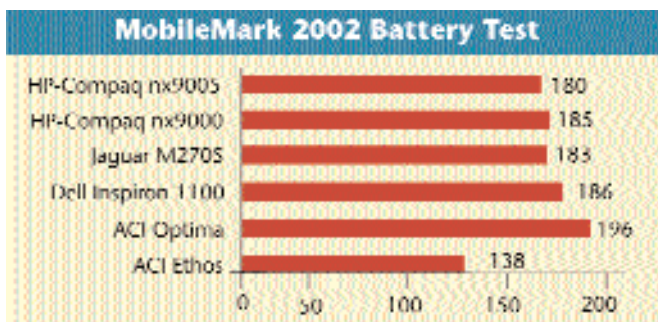
Owing to a slow processor, it finished last in the CPU tests. However, the memory sub-system is quite brilliant, and managed to beat the ACi Optima by a small margin. The hard disk subsystem is a complete mess and its scores are the lowest. It yielded a pathetic frame rate while playing *Quake III Arena* and could hardly be used for graphics-intensive tasks.

If you are looking for a laptop to make presentations and work with Word processors and Excel sheets, the M270S is a good buy at just Rs 55,000—the second cheapest in our comparison.



Jaguar M270S	C+
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 55,000
 + Decent looks
 - Low features and performance



History of Laptops

1970s: Alan Kay, of the Xerox Palo Alto Research Center, California, builds the Dynabook that can handle most computing needs, and has wireless network capabilities.

1979: William Moggridge designs the Grid Compass. It has a 340 KB bubble memory, a die-cast magnesium case and a folding electro-luminescent graphics display.

1981: A book publisher, Adam Osborne, comes up with the Osborne 1. With a 5-inch screen, modem port, two 5.25-inch drives, a battalion software and a battery pack. It weighs almost 11 Kgs and costs \$1795 (about Rs 86,000). The Epson HX-20—a battery-powered portable computer, with a 20-character by 4-line LCD display and built-in printer—is also released.

1983: Gavilian Computer—it has 64 KB RAM, a Gavilan operating system (also runs MS-DOS), an 8088 microprocessor, touchpad mouse, portable printer and weighs 4 Kgs—6.4 Kgs with the printer. Radio Shack also releases the TRS-80 Model 100. Microsoft wrote its ROM programs—Bill Gates wrote a few himself! It uses standard AA batteries.

1984: IBM announces the IBM 5155 Portable Personal Computer—equipped with 640K RAM, two double-sided 5.25-inch drives, and an amber monochrome monitor. Apple also launches the Apple IIc model—a notebook-sized computer that had a 65C02 microprocessor, 128 kilobytes of memory, an internal 5.25-inch floppy drive, two serial ports, a mouse port, modem card, external power supply, and a folding handle.

1986: IBM introduces its IBM PC Convertible. It uses an 8088 microprocessor, has 256 kilobytes of memory, two 3.5-inch floppy drives, an LCD, parallel and serial printer ports and a space for an internal modem. It came with its own applications software, weighed 5.4 Kg and sold for \$3,500 (about Rs 1,68,000).

Conclusion

The mainstream category was completely dominated by models from two vendors, namely HP Compaq and ACi, with each of them sending in two models. Despite their relative similarity in terms of hardware configuration, the HP Compaq models were distinctively different from the rest of the crowd; in fact they were the best looking laptops in the comparison with unmatched aesthetic appeal.

The ACi Ethos4 is targeted at the low-end market and provides reasonably good hardware, but lacks style and scores low on the appeal. The Jaguar is a complete copy of the Ethos4, with just different colour and body panels. Both these laptops are a complete no-no if you like some flair. The ACi Optima is based on the Centrino platform and offers better features, but like its low-end sibling, lacks sophistication when it comes to looks. The Dell Inspiron 1100 looked great, and performed even better.

In terms of features, the HP Compaq nx9000 beat most of the laptops hands down, its aggressive yet sophisticated styling helped it take the top honours for this category. We had no doubt about it being the winner—It had the right mix of the required ingredients.

While the Dell Inspiron and ACi Optima did exceptionally better than the HP Compaq in pure performance, they lost to the nx9000 on all the remaining factors. The HP Compaq nx9005 claimed the value for money title with its good looks, decent performance and pricing. Overall, HP Compaq swept clean all the titles in this category.

CATEGORY
MAINSTREAM LAPTOP

Brand	ACI	ACI	Dell	Jaguar	HP-Compaq	HP-Compaq
Model	Ethos	Optima	Inspiron 1100	M270S	nx9000	nx9005
Processor (Type and speed)	Pentium4 M 1.8 GHz	Pentium M 1.7 GHz	Pentium 4 2.6 GHz	Pentium4 M 1.7 GHz	Pentium 4 M 2.2 GHz	AMD Athlon 2200+ XP
Memory (Amount)	256 MB	512 MB	256 MB	256 MB	256 MB	256 MB
TFT Display Screen size (Inches)	14	15	14	13.3	15	14
Hard disk (Capacity, speed in rpm)	40 GB / 4,200	60 GB / 4,200	30 GB / 4,200	20 GB / 4,200	40 GB / 4,200	20 GB / 4,200
Graphics adapter	SIS650 S3 graphics	Intel 855	Intel Extreme graphics	SIS 650 S3 Graphics	Radeon IGP	Radeon IGP
Optical drive	CD-ROM	DVD-RW	Combo	CD-ROM	Combo	CD-ROM
Sound card	RealTek AC97	RealTek AC97	AC97	Avanche AC97	AC97	AC97
Ports (USB/Serial/parallel/Firewire)	2 USB/✓/✓/✓	3 USB/✓/✓/✓	2 USB/✓/✓/✓	2 USB/✓/✓/✓	2 USB/✓/✓/✓	2 USB/✓/✓/✓
Connectivity (IrDA,WiFi etc,LAN,Modem)	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓
Audio-Video OUT options	Monitor D-SUB and S-Video	Monitor D-SUB and S-Video	D-Sub and S-video	Monitor D-SUB and S-video	Monitor D-Sub and S-video	D-Sub and S-video
Mouse Touch pad and No of buttons	✓ / 2	✓ / 2	✓ / 2 buttons	✓ / 2 button	✓ / 2 buttons	✓ / 2 buttons
Shortcut keys on keyboard (nos)	✓	✓	1 button	3 buttons	5 buttons	5 buttons
Extra Batteries provided	✗	✗	✗	✗	✗	✗
Compact Flash slots (nos)	1	1	1	1	2	2
Miscellaneous	✗	✗	✗	✗	Touchpad On/Off switch	Touchpad On/Off switch
Usability (15%)						
Dimensions (L x W x H) (mm)	300 x 245 x 40	350 x 260 x 35	320 x 270 x 42	300 x 245 x 40	327 x 272 x 38	327 x 272 x 38
Weight (Kg)	3.1	3.1	3.3	3.1	3.2	3
Extra Input Devices (pointing stick, scroll pad)	✗	2 scroll buttons	✗	✗	Touch scroll	Touch Scroll
Build Quality (S05)	3	3	4	3.5	4	4
Keyboard Touch and Feel (S05)	3	3	3.5	3	3.5	3.5
Mouse Touchpad sensitivity (S05)	3.5	3.5	3.5	3.5	4	4
Overall Ergonomics (S05)	3	3	3.5	3	4	4
Built-in speaker Quality test (S05)	3	2.5	2.5	2.5	3	3
Temperature (Deg Clesius)						
Ambient Temp	29	26	26	26	26	26
Laptop under surface	38	37	33	38	33	35
Operating System bundled	✗	✗	Windows XP Home	✗	Windows XP professional	Windows XP pro
Office application suite	✗	✗	Corel Word perfect	✗	✗	✗
Other software & applications provided	✗	Easy CDcreator, Inter DVD	Encarta 2004, WinDVD, Money 2004 & sonic Record	✗	Norton antivirus, roxio and win DVD	Norton antivirus, roxio and win DVD
Recovery CDs (Y/N)	✗	✗	✓	✗	✓	✓
Accessories (carry case,docking station,etc)	Carry case and Power adapter	Carry case, Power adapter and external FDD	Power Adapter and case	Carrycase and power adapter	Carrycase and power adapter	Carrycase and power adapter
User guide	✓	✓	✓	✓	✓	✓
Overall System benchmark						
ZD-Bench Business winstone 2002 (Units)	19.3	29.4	23.2	19.3	18	18
Video Encoding Test (Sec)	148	76	114	151	147	136
Si soft Sandra (CPU test)						
CPU Dryhstone	4,784	5,713	6,156	4,662	5,624	6,449
CPU Whetstone	1,034	2,293	1,370	976	1,267	2,726
Multimedia - CPU Integer	7,160	9,717	9,491	6,766	8,752	9,967
Multimedia - FPU SSE	9,411	11,293	12,054	8,617	11,161	10,633
Memory test						
ALU / RAM (Int)	1,037	1,652	1,703	1,667	1,157	1,224
FPU / RAM (Fit)	1,039	1,652	1,706	1,669	1,161	1,174
File system test						
Drive Index MBps	11,482	Failed	13,001	10,911	14,899	10,538
Sequential Read MBps	16	Failed	19	15	21	17
Random Read MBps	4	Failed	4	4	4	4
Sequential Write MBps	16	Failed	17	14	20	5
Random Write MBps	4	Failed	5	4	8	3.5
Average access time (ms)	11	Failed	12	11	12	14
Quake III Arena (fps)						
Normal (640 x 480 x 16)	56.9	124.1	91	65	82	82
High (800 x 600 x 32)	42.7	65	52	47	55	45
Max (1024 x 768 x 32)	26.8	35	29	30	35	25
3D Mark2001 SE	1,055	1,898	1401	1,006	1,619	1,559
Displaymate assorted test (S05)	2.5	3	4	2.5	3.5	3.5
MobileMark 2002 Battery Test	2 Hrs 18 Min	3 Hrs 16 Min	3 Hrs 6 Min	3 Hrs 3 Min	3 Hrs 5 Min	3 Hrs
Performance (45%)	22.76	33.42	32.68	28.64	31.06	29.47
Features (35%)	15.70	19.70	13.10	16.90	26.60	20.10
Usability (15%)	8.70	8.70	9.00	7.40	11.30	10.60
Package content (5%)	1.50	1.50	3.80	1.50	3.40	3.40
Overall	48.66	63.32	58.58	54.44	72.36	63.57
Value for money (scale of 5)	3.5	2.8	2.9	3.1	2.6	3.6
Grade	B	C	C	C+	C	B+
Price (Rs)	54,990	89,990	79,769	55,000	1,10,000	70,000

FEATURES (35%)
PACKAGING (5%)
PERFORMANCE (45%)
OVERALL SCORE
OTHER

THIN AND LIGHT CATEGORY

Thin and light, as the name suggests, is the category hosting laptops that have struck a fine balance between computing power and usability, while keeping in mind mobility. The critical parameters that include any notebook into this category are thickness and the weight. Since Intel's Centrino platform promises these parameters, apart from a better battery life, most Centrino-based notebooks fall into this category. Their thickness ranges from 2.5 cm to 3 cm, and the weight ranges from 2 Kg to 3 Kg.

These laptops pack good performance, and if supplement-

ed by 512 MB of RAM (not that 256 MB won't work), return great results even under intensive and graphically heavy applications such as games. All the contenders, except the BPL Notebook, had DVD-CDRW combo drives, and nearly all of them came with a healthy reserve of 40 GB of hard drive space. Wireless connectivity is another boon of the Centrino platform, and it makes for one more option in addition to the normal Ethernet and modem.

ACi Centrino

Too hot to handle

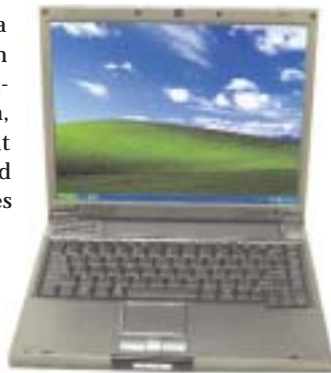
The ACi Centrino is a stern looking laptop with a leather upholstery finish on the top panel. At 32 mm, it was the thickest model, but weighed less than the Acer and BPL laptops, tipping the scales at 2.5 Kgs.

The ACi Centrino packs in an Intel Pentium M 1.7 GHz processor, 512 MB of DDR RAM, a 40 GB hard drive and a 14-inch TFT LCD. The integrated Web cam is useful for video-conferencing. However, the video looks quite dark and image quality is strictly okay.

Ergonomically, the keyboard can do with slightly bigger keys. The small touch pad is highly accurate in pinpointing. Though the two scroll buttons serve their purpose, a scroll pad would have been of great help.

It performed better than the rest, due to its higher clocked processor and 512 MB of RAM. The Business Winstone tests saw it finish ahead of the IBM T40 and the Acer TravelMate 290 by 3 units. Strangely, SiSoft Sandra continuously failed to show the Dhrystone value properly, and returned a very low score. The accolades for the marvellous Whetstone values should be given to its processor. Overall, the system performed perfectly as a whole. It's onboard Intel graphics adapter lost out to the IBM T40's Radeon 7500. By the time we concluded the test, its bottom was a whopping 43 degree Celsius hot!

Given its configuration, the ACi Centrino is perfectly priced at Rs 89,990. Opt for it if you need a simple and elegant laptop and can put up with some heat!



ACi Centrino	C+
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 89,990
 + Sober looks, the latest hardware
 - Gets heated up

Acer TravelMate 290

Beast outside, beauty inside

Already lacking in aesthetic appeal, the plastic grey body and huge dimensions of the Acer TravelMate 290 make it look even worse. The black keyboard inscribed with bold characters and the silver-lined touchpad breaks the otherwise bland grey plastic. A bigger keyboard would have suited the laptop rather than the small keyboard that leaves vast empty plastic panels for palm rest. The laptop is solidly put together and feels rugged.

Configuration-wise, it comprises an Intel Pentium M 1.4 GHz CPU, 256 MB DDR RAM, a 40 GB hard drive and a crisp 15-inch TFT LCD screen. The combo-drive is placed in front and is prone to popping when your fingers touch the eject button accidentally. There are no extra frills, say, Audio DJ, flash memory card readers, etc, to spoil you.

The Travelmate 290 performed well across the board. It was on par with most of the other notebooks in the CPU test. In the system-benchmarking test that used Business Winstone, it was only three units behind ACi Centrino and just 0.3 units behind the IBM T40. In *Quake III Arena*, it was on par with other systems, delivering a jerk-free frame rate even at the highest settings. The Intel onboard graphics controller definitely has enough power to run graphically demanding applications to certain extent. The batteries lasted for a little over 4 hours on par with the Wipro Little Genius.

For a product that has nearly everything you can expect from it, Rs 79,990 isn't too much to pay.



Acer TravelMate 290	B+
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Build quality	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 79,790
 + Good overall performance
 - Bulky design

BPL Notebook

Full of ergonomic glitches

The BPL Notebook has an Intel Pentium M running at 1.3 GHz and a measly 128 MB of DDR RAM. Using Windows XP on this laptop is an agonising experience, which was clearly reflected in the scores. Though the Zenith laptop also had the same CPU, it zoomed ahead of the BPL in the ZDbench Business Winstone system benchmark test owing to its 256 MB of RAM.

The 40 GB hard drive is a welcome move, but a combo-drive would be better than the DVD-ROM it has. Although based on a Centrino platform, the laptop offers optional wireless connectivity. Its silvery body and oddly coloured blue translucent keys aren't impressive either. At 2.7 Kg, it's heavy but not too bulky.

Ergonomically, the keyboard and touchpad are comfortable. The layout of the keys is spacious. The optical drive is placed on the bevelled edge in the front, but the eject button does not protrude making access to the drive all the more difficult; the scroll pad lacks tactile feel. The control keys for the Audio DJ function are located near the bottom of the screen. Hence, you need to flip open the top every time you want to skip a song. Ideally, these controls should have been placed at the edges. Other nifty features include flash memory readers for SD and MMC cards.

The BPL notebook pitched in an average performance. Compared to other laptops, it had fairly good scores in the CPU benchmarks, but the Business Winstone scores were pathetic.

It finished second in the battery-life test—the battery lasted for almost 5 hours. It's quite expensive at Rs 85,000, so we don't recommend it taking into account its ergonomic issues and the below par configuration.



BPL Notebook	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

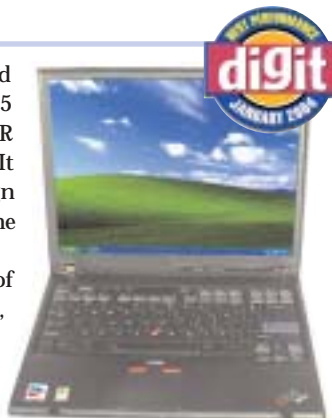
Price: Rs 85,000
 + Slim design
 - Full of ergonomic flaws

IBM T40

The FORTeeeeee

The IBM T40 we received comprised a Pentium M 1.5 GHz with 256 MB of DDR RAM and a 40 GB hard drive. It weighs only 2.2 Kg. The design makes good use of space, and the attention to detail is exemplary.

A thumb slider on the right of the lid actuates the two latches, and a grip on the left side lets you hold it firmly. The combo-drive is housed in a slot on the right and has a step design



with the eject button on the lower step to avoid accidental popping. Ergonomically, the T40 has hardly a flaw, except for the missing Windows key—but you can configure [Ctrl] or [Alt] to act as one. It has a touchpad with two small buttons and a pointing stick.

It has innovative features such as a night lamp incorporated above the screen. No recovery CDs are provided, but its factory defaults are present on the hard drive. Access these by pressing the blue IBM Access button during bootup. These allow you to re-partition, format, install the OS and other software. Use IBM's Rapid Restore software to backup data and retrieve it from the special menu itself.

The IBM T40 topped most of the tests. The Business Winstone saw it return 27.7 units, making it ideal for business applications such as MS-Office etc. In *Quake III Arena*, the ATI Radeon 7500 yield extremely good results, posting 229 fps in normal mode—the best in the entire category.

It topped the list when all other criteria such as usability, package content, etc., were considered, and thus bagged the title.

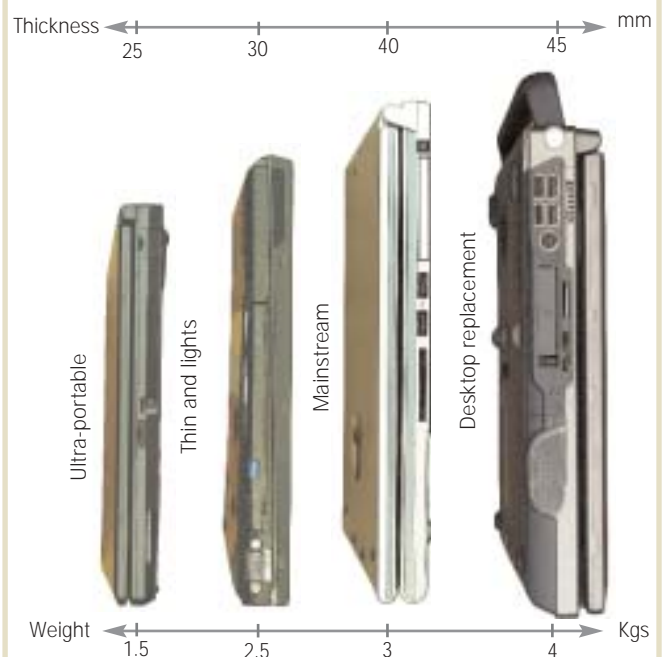
The fully charged batteries last for nearly 3 and a half hours. Rs 1,70,000 makes it expensive, but you get more than what you're paying for. We have no qualms in offering it the crown that it deserves.

IBM T40	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 1,69,900
 + Great design, superb performance
 - Expensive

Through Thick and Thin

We categorised the laptops that came in for the test based on their thickness and weight.



Wipro Little Genius

The crown prince

The Wipro Little Genius has a great grey silver body; subtle use of chrome for the Scroll button and the lid lining add a touch of style. The translucent buttons are etched with white inscriptions that are easy to read in poor light. All the keys fall within easy reach. The touchpad is placed towards the left and is difficult to reach at times, especially if you use the keys at the extreme right. The battery and the swappable optical drive can be easily removed. Overall, the build-quality is top notch, but the attention to detail is nowhere near the IBM laptop.



Equipped with a 1.4 GHz Pentium M processor and 256 MB of DDR RAM, the 20 GB hard disk is too less and one should consider the optional 40 GB hard drive. Windows XP Home Edition and Norton AntiVirus are bundled along. The DVD-ROM is a standard accessory, while the combo drive is optional. The infra-red port is placed at an uncomfortable extreme right side corner. All other connectors—USB ports, LAN, etc—are conveniently placed for uninterrupted use. The neon blue LEDs for system status indicators give the laptop a

pleasing appeal. The Audio DJ lets you use the optical drive as a CD player without switching on the entire system. Memory card readers allow SD and MMC cards to be read directly. Unfortunately, the Little Genius heats up to a sweaty 42 degrees.

It displayed good performance and came in very close to the IBM T40 in most of the tests. The overall system benchmark that used ZDbench Business Winstone just saw a marginal difference between the two. The T40's graphics card vanquished the humble Intel 855 onboard display on the Wipro laptop. However, it beat the IBM in the battery life test, lasting over 4 hours—the highest in the comparison. Its carry case was the best amongst the lot, with a lot of storage space.

At Rs 80,000, this laptop packs a punch; buy it if you can't afford the IBM T40.

Wipro Little Genius

B

Performance	▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶
Build quality	▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶

Price: Rs 91,990
+ Elegant design
- Low on features

outlined silver-black body. The layout of the keys, though well-spanned, leaves enough space for your palm to rest. The optical drive and two USB ports are placed on the right side for easy access, whereas a Type-II Compact Flash slot and connectors for an external monitor, LAN and modem are placed to the left. It has 4 USB ports and a single PS/2 port. No serial or parallel port is provided. The only flaw was its thermodynamics. Its temperature soared to 42 degrees Celsius even before the test could conclude.

Though equipped with just a low-powered 1.3 GHz processor, the laptop turned in a decent performance, with scores pretty much in the same league as that of the IBM T40 and Acer TravelMate 290.

The bottleneck was the hard disk, which was quite evident from the SiSoft Sandra's hard disk scores that were the lowest amongst its brethren. The batteries went dead after 3 hours of continuous usage. Zenith does not bundle any OS with the laptop and leaves it as a customisable option.

Priced at Rs 70,000, the Zenith ONE-UP Notebook (Wi-Fi 4X) a must buy for those on a shoestring budget. Be prepared for a hot lap though!



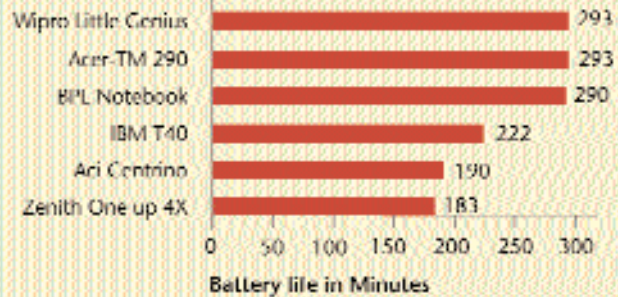
Zenith ONE-UP Notebook (WIFI 4x)

A-

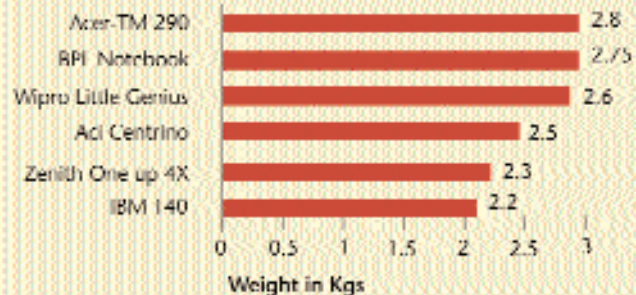
Performance	▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶
Build quality	▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶

Price: Rs 70,000
+ Great value for money
- Heats up

MobileMark 2002 Battery Test



Weight



Zenith ONE-UP Notebook (Wi-Fi 4X)

Centrino for masses

The Zenith ONE-UP notebook comes with a Pentium M 1.3 GHz, 256 MB of DDR RAM, a 30 GB hard disk and a combo-drive. For the first time ever, Zenith adopted a sober, subtle styling, resulting in a good-looking notebook with silver shades amidst a black background. The keyboard is another touch of style with grey keys looking fantastic on the

Laptop Accessories

External mice: It's quite tiresome to work long hours on a laptop, especially if it involves a lot of cursor activity. It is advisable to keep an external USB mouse for such sessions. Many vendors have introduced optical mice for laptops. These are small and fit into your carry case with ease. They are slightly uncomfortable, but still better than the touchpad.

Carry cases: Laptops come with reasonably good looking and sturdy carry cases. These usually have a pocket to accommodate the power adapter. However, if you are a frequent flier and carry other accessories along, look out for specially made laptop bags. Elegant leather bags that have special pockets to keep the power adapter, external optical drives, etc., are more durable than the resin bags provided by the manufacturer. Hard-cased laptop bags protect the laptop from excessive wear and tear.

External laptop coolers: The use of desktop components in entry-level laptops reduces costs. However, these components also dissipate a large amount of heat. Strangely, hardly any of the laptops have ventilation systems efficient enough to deal with this problem.

Companies providing cooling solution for desktops saw this opportunity and developed an external cooling solution for laptops that helps to reduce the heat dissipation. Antec's laptop cooling solution has a plastic base with a brushed perforated aluminum surface that makes contact with your laptop. Two high-rpm fans placed between the plastic base and the aluminum surface draw the heat away from the laptop. Moreover, the cooler is USB-powered and offers a USB port, so that you still have a USB port on the laptop.

External lights: IBM integrates small LEDs into the LCD screen so that you can see the keys clearly when working in the dark. For other laptops, use USB-powered light sources that you can clip to the top of the screen.

Standby batteries: Usually, laptop batteries last for about 5 hours. Hence, it makes sense to carry a charged standby battery along while travelling.

We recommend that you purchase these batteries from the laptop manufacturer rather than from a third-party vendor at a lower rate.

Other accessories: A Kensington lock is a wire lock that can be used to secure the laptop to a desk. Protect your LCD screen using a screen protector. These are thin plastic sheets

that can be stuck to the LCD to prevent it from getting scratched.

Use special lint-free fabrics to clean the LCD screen.



A Kensington lock

Conclusion

The thin and light category saw the largest concentration of products with six laptops, ranging from the modest ACi to the renowned IBM. Similarly, the hardware used also varied widely with the ACi laptop packed to the hilt with the latest and best processor available, while the others relied upon a reasonably fast 1.4 GHz processor.

In the performance aspect, no laptop could come close to the ACi Centrino as far as business applications are concerned. However, the ACi laptop could not repeat the same performance in the rest of the tests. This set the stage for the IBM T40. This participant gave a balanced performance across the entire battery of tests. The Wipro Little Genius and Acer TravelMate 290 made a valiant effort to beat the IBM, but fell short of a few points—0.2 and 0.9, respectively. The contenders from Zenith, BPL and ACi formed a triad that were on par with each other in most of the tests.

Performance apart, no other laptop could match the IBM T40 in terms of usability, features and package bundling. These were the factors that let this contender from IBM sprint ahead of its competitors, and rule this category.

Zenith does not bundle an OS along with its laptop. This certainly helps both Zenith and the consumer, since they can pay for the OS of their choice. The Zenith ONE-UP Notebook (WiFi 4X) priced at Rs 70,000, offers the best bargain deal, thus scoring very high on our value for money scale. As for the Wipro and Acer laptops, they lost to a better product, but not ashamedly so, because they are mighty good for the price they demand.

1/4th AD

CATEGORY
THIN AND LIGHT

Brand	Aci	Acer	BPL	Wipro	IBM	Zenith
Model	Centrino	TravelMate 290	Notebook	Little Genius	T40	One Up 4X
Processor (Type and Speed)	Pentium M 1.7 GHz	Pentium M 1.4 GHz	Pentium M 1.3 GHz	Pentium M 1.4 GHz	Pentium M 1.5 GHz	Pentium M 1.3 GHz
Memory (Amount)	512 MB	256 MB	128 MB	256 MB	512 MB	256 MB
TFT Display Screen size (inches)	14.1	15	15	14.1	14.1	14.1
Hard disk (Capacity / Speed in rpm)	40 GB / 4,200	40 GB / 4,200	40 GB / 4,200	20 GB / 4,200	40 GB / 4,200	30 GB / 4,200
Graphics adapter	Intel 855	Intel 855	Intel 855	Intel 855	ATI mobility Radeon 7500	Intel 855
Optical drive	Combo Drive	Combo Drive	DVD-ROM	DVD-ROM	Combo Drive	Combo Drive
Sound card	RealTek AC'97	RealTek AC'97	CMI AC97	SigmaTel C-major Audio	Soundmax	CMI AC97
Ports (USB/Serial/parallel/Firewire)	2USB/X/X/✓	3USB/X/✓/✓	3USB/X/✓/✓	3USB/X/X/✓	2 USB/X/✓/✓	4 USB/X/X/✓
Connectivity (IrDA,WiFi,LAN,Modem)	X/✓/✓/✓	✓/✓/✓/✓	✓/Optional/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓
Audio-Video OUT options	Monitor D-Sub and S-Video	Monitor D-Sub and S-Video	Monitor D-Sub and S-Video	Monitor D-Sub, S-Video	Monitor D-Sub and S-Video	Monitor D-SUB
No of Shortcut keys provided	3	2	3	X	4	X
Extra Batteries provided	X	X	X	X	X	X
No of Compact Flash slots	1	1	1	1	2	1
Miscellaneous	Web cam integrated	X	Flash memory card reader, Audio DJ CD-audio player	memory card reader, Audio CD	Night Lamp, LCD switch OFF button, spill-proof keyboard	X
Usability 20%						
Dimensions (L x W x H) (mm)	305 x 260 x 32	333 x 276 x 32	320 x 275 x 25	318 x 277 x 30	305 x 250 x 28	310 x 259 x 30
Weight (Kgs)	2.5	2.8	2.75	2.6	2.2	2.3
Extra Input Devices (Scroll, pointing stick)	2 Scroll buttons	X	Scroll Pad	Scroll Pad	Track point and zoom button	Scroll pad
Build Quality (S05)	3.5	3.5	3.5	3.5	4	3.5
Keyboard touch and feel (S05)	3	3	3	3.5	4	
Mouse Touchpad sensitivity (S05)	3.5	3.5	3.5	3.5	4	3.5
Overall Ergonomics (S05)	3	3	3.5	3.5	4	3.5
Built-in speaker Quality test (S05)	2.5	3	2.5	3	3.5	3.5
Temperature						
Ambient Temp (degree Celsius)	28	26	26	26	26	26
Laptop under surface (degree Celsius)	43	38	34	42	33	42
PACKAGING (10%)						
Operating System bundled	X	Win XP Home Edition	X	Win XP Home edition	WinXP Professional	X
Office application suite	X	X	X	Norton Antivirus	Norton Antivirus	X
Other software & applications provided	B's Recorder Gold, WinDVD 4	X	X	Inter Video WinDVD		B's Recorder Gold, WinDVD
Recovery Options	X	✓	X	✓	✓	X
Accessories (carry case,docking station,etc)	Carrycase, power adapter	Power adapter	power adapter	carry case,power adapter	Power adapter	Carrycase, power adapter
User guide	✓	✓	✓	✓	✓	✓
PERFORMANCE (20%)						
Overall System benchmark						
ZD-Bench Business winstone 2002 (units)	30.4	27.4	18.7	26.1	27.7	24.8
Video Encoding Test (Seconds)	76	90	94	89	83	80
SiSoft Sandra (CPU test)						
CPU Dryhstone	845	4690	4,255	4,543	4,884	4,294
CPU Whetstone	2,275	1,877	1,733	1,857	1,998	1,751
Multimedia - CPU Integer	9,719	7,979	7,431	7,975	8,534	7,420
Multimedia - FPU SSE	11,269	9,274	8,636	9,277	9,932	8,640
Memory test						
ALU / RAM (Int)	1,728	1,721	1,745	1,689	2,010	1,695
FPU / RAM (FIT)	1,730	1,725	1,751	1,700	2,010	1,703
File system test						
Drive Index (MBps)	13,624	14,152	13,839	18,946	15,766	13,754
Sequential Read (MBps)	19	21	19	28	23	19
Random Read (MBps)	4	4	5	4	5	5
Sequential Write (MBps)	19	17	19	27	21	17
Random Write (MBps)	4	5	6	6	6	7
Average access time (ms)	12	13	10	12	10	10
Quake III Arena-(fps)						
Normal (640 x 480 x 16)	127	121	118	122	229	120
High (800 x 600 x 32)	66	65	63	65	125	90.1
Max (1024 x 768 x 32)	37	31	17	35	78	46.5
3D Mark2001 SE	1,972	1,854	Failed	1,883	4,109	1,995
Displaymate assorted test (S05)	3	3.5	2.5	3	4	3
MobileMark 2002 Battery Test	3 Hrs 10 Min	4 Hrs 53 Min	4 Hrs 50 Min	4 Hrs 53 Min	3 Hrs 42 Min	3 Hrs 3 Min
OVERALL SCORE						
Performance (35%)	20.24	24.03	22.89	24.78	24.93	20.54
Features (35%)	21.10	23.10	23.10	20.60	26.40	23.10
Usability (20%)	10.70	10.80	13.00	10.90	15.50	12.00
Package content (10%)	4.00	4.00	2.00	8.00	9.00	4.00
Overall	56.04	61.93	60.99	64.28	75.83	59.64
OTHER						
Value for money	3.11	3.87	3.59	3.49	2.23	4.26
Grade						
Price (Rs)	89,990	79,990	85,000	91,990	1,69,900	70,000

DESKTOP REPLACEMENTS

As the name suggests, these laptops are built to retire the bulky desktop PC without compromising on the performance aspect. They take up lesser amounts of space than a normal PC, and offer certain amount of mobility. Desktop replacements are bulky and weigh above 3.5 Kgs, making them the heaviest among all notebook categories. Their thickness varies with the components and the number of connectors present on the laptop. In fact, some of them may not come with batteries, and hence need a constant power supply.

Since desktop replacements are supposed to fill in for a full-fledged PCs, they have all the ports available on a standard sys-

tem, and at the same time, perform just as well. While buying a desktop replacement, pay attention to the screen size, the available hard disk space and the type of hard disk. Many might come with a normal IDE hard disk that is cheaper than most small laptop hard disks. Do remember to make a note of the processor and the amount of RAM you require for doing your tasks, especially if you use memory-intensive applications such as Photoshop. Large comfortable keyboards, tabs on the under surface that incline the keyboard at an angle, and other such features add to its comfort levels.

ACi Ultima

Portable theatre

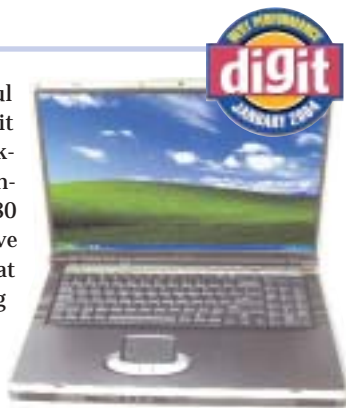
The ACi Ultima is powerful and well-balanced—it cramps in a standard desktop Pentium4 2.26 GHz, a mammoth 1 GB of DDR RAM, an 80 GB hard drive and a combo-drive as well. The 17-inch wide format TFT gives you a great viewing experience.

The outer casing is finished in silver. Weighing 4.1 Kgs, it packs in a standard keyboard with jet-black keys and bright white inscriptions. The touchpad is slightly offset towards the left. This comes in the way while using the number-pad keys. Placing it in the dead centre would have improved its ergonomics.

Other features included are an integrated Web-camera and a TV-tuner with a remote control. The air exhaust ports are underneath—hardly 5 mm above the desk. Thus, air is pushed towards the keyboard causing the keys to heat up. The base was a searing 45 degrees Celsius by the time the test concluded.

Performance-wise, the Business Winstone score was amongst the best, but we expected more. The Pentium 2.26 GHz passed the CPU test with flying colours. The memory, as well as the hard disk, also returned commendable scores. This system can handle any resource-hungry application without a hitch. The onboard Radeon 9000 graphics adapter turned in a good frame rate in *Quake III* and *Unreal Tournament*, but don't expect the same performance when playing *Half-Life2*, *Halo 2* or any new games.

Though a wee bit expensive at Rs 1,20,000, there is no other laptop that can match the ACi Ultima's combination of configuration and looks.



ACi Emerald Pro

Call it the diamond

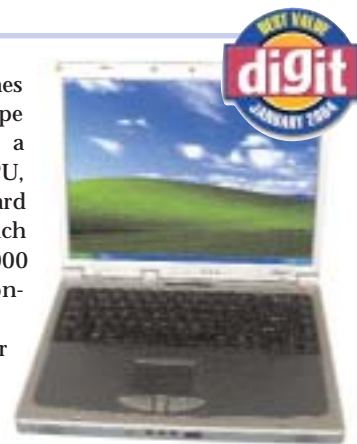
The ACi Emerald Pro pushes the performance envelope further by including a desktop Pentium 3.06 GHz CPU, 512 MB of RAM, a 40 GB hard disk, a combo-drive and a 15-inch TFT LCD. The Radeon 9000 graphics adapter makes a wonderful graphics sub-system.

The good use of colour combination gives this muscular laptop a distinct character. Weighing 3.5 Kgs, it was the lightest, and also the thinnest in this category. The keyboard is not as comfortable as the one on the Ultima. Due to its reduced size, a full-size keyboard was omitted. The touchpad is again biased to the left, and causes some discomfort. The touchpad buttons are stiff, and require quite an effort to click. This laptop also comes with an integrated Web cam that's placed just above the LCD.

The Emerald Pro seared to 40 degrees—even the keyboard and touchpad get hot due to the trapped heat.

On the performance front, the Hyper-threaded CPU and the 512 MB of RAM yielded excellent results. It finished video encoding in just 95 seconds—the fastest in the entire comparison. Similarly, the Business Winstone returned a high score of 27, an indication of its capability to handle resource-hungry applications. The gaming benchmarks also saw the laptop returning some terrific scores. Despite such power-hungry components, the battery can still last for 2 hours and 18 minutes.

Priced at Rs 74,000 it offers a great price-to-performance ratio—just as long as you carry a portable air conditioner.



ACi Ultima	C-
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 1,20,000
 + Amazing wide-format LCD screen, good looks
 - Emits a lot of heat

ACi Emerald Pro	B+
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 74,000
 + A good configuration, great performance
 - Gets heated, lacks aesthetic appeal

BPL DeskBook

Starved of resources

Weighing 4.25 Kgs, the BPL DeskBook was the bulkiest, measuring about 50 mm thick. The dull silver-grey finish and grey plastic used for the keyboard and touchpad give it a bland look. It has well spaced keys and a large palm-rest. The touchpad is sensitive, but its buttons are tacky. It's configured with a desktop Intel Pentium 4 1.5 GHz, 128 MB of RAM, a 40 GB hard drive, a 15-inch LCD screen and a DVD-ROM. The processor is underpowered, and 128 MB of RAM isn't enough to run Windows XP. There is no standby battery, so you have to calculate your usage.



The only exciting feature is the flash memory card reader. BPL has also provided a carry handle for the DeskBook; fold back the carry handle to use it as a peg that inclines the DeskBook while typing. Interestingly, it has the best ventilation system, and stayed at 32 degrees Celsius even after 4 hours of use.

Its performance was nowhere near the ACi laptops. In the Business Winstone, the measly 128 MB took its toll and the system returned a mere 14 units. Video-encoding took over 2 and half minutes. However, the standard IDE hard drive scored impressively. The onboard 845 display adapter did a poor job on graphics.

The BPL DeskBook is priced at an affordable Rs 61,900. Though this is quite okay for its configuration, we recommend it only if you need an affordable desktop replacement that you do not wish to use on the move and can sacrifice on performance.

Price: Rs 61,900
 + Great build-quality
 - No batteries

BPL Deskbook	B-
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Fujitsu LBC 2220

Fashion victim

The Fujitsu LBC 2220 marries great looks with perfect ergonomics and a decent performance to give birth to a great product.

It comes with an Intel Pentium 4 M 2.2 GHz, 256 MB of RAM, a 14.1-inch crisp TFT LCD and a 30 GB hard drive. The underlying Radeon chipset provides an integrated graphics adapter for some decent gaming. Four USB ports, a serial and parallel port each, are provided. Apart from the Ethernet and modem connector, it also features wireless connectivity. A memory card reader is also included.

Lighter shades of silver on its outer surface and a darker silver grey on the inside, give the laptop a distinct style statement. The off-white keyboard gels perfectly with the theme, as does

3D Gaming on Laptops

Gaming on laptops has evolved in leaps and bounds today, from playing simple games such as *Solitaire* and *FreeCell*, to graphically intensive and complex *Quake III* and *Unreal 2*. This has become possible due to the availability of powerful processors such as the Pentium 4-M, and the introduction of better graphics chipsets such as the Geforce Go series from nVidia, and the Radeon Mobility range from ATi. But for an avid gamer, playing games on a notebook will never offer the same depth and immersion as playing on a desktop computer. This is partly due to the presence of the thin liquid crystal-based displays for the notebooks. Although LCDs are the obvious choice as display units due to their minimal weight and sleek design, the flatness of their screens limits the viewing angle. Also, while playing 3D games on a LCD, the player's view often appears to be boxed and limited, giving the impression of a 2D game, rather than a full-blown 3D experience. Though, this can be corrected by wearing special 3D glasses while viewing 3D applications, but these glasses are usually very expensive and hard to obtain. A more practical and simpler method has been discovered to convert the flat screen of a LCD into a 3D display, using plain transparent cellophane—sheets of plastic used for packaging. This cellophane technique is based on the principle of how humans perceive three-dimensional objects in their field of vision, and the fact that the light from a LCD is polarized light.

Human vision is stereoscopic in nature, i.e. besides length and width; we can also gauge depth and height, and therefore discern and correctly identify 3D surfaces and objects. While looking at any object, both the right and left eye send separate images to the brain, which then merges the two, and then gauges the actual depth and distance of the object from the differences in the images. But our visual system is not sensitive enough to gauge the difference between ordinary light and polarized light. Ordinary light consists of a scattering of light waves, which vibrate in different planes from each other; whereas in polarized light, the light waves vibrate coherently in a single plane. The main advantage of polarised light is that it can be blocked and manipulated very easily just by altering its direction of polarization. Cellophane has this distinct ability to rotate the direction of polarization of any polarized light passing through it.

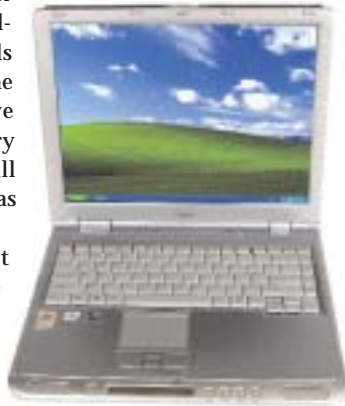
The light from the LCD in laptops is linearly polarized due to the presence of a polarizer sheet covering the top surface of the liquid crystal screen. Now take a cellophane sheet, and cover half of the laptop screen with it. This will create an effect wherein your left and right eyes will perceive two slightly different images due to the polarization occurring at one half of the screen. The 3D effect is finally obtained, when a crossed polarized sheet i.e. a sheet which has its polarizers oriented at a difference of 90 degrees to the cellophane on the laptop, is placed a little distance away from the screen, in front of the observer. And so, with a little bit of ordinary cellophane, you can enjoy an unrestricted and complete 3D experience, while playing your favourite 3D games.

the off-white touchpad, with silver-grey buttons surrounding it. The Audio DJ controls are placed in the front on the bevelled edge. Hard drive access, AC power and battery life are displayed on a small LCD screen that also serves as an Audio DJ display.

A toggle button makes it easy to switch between the computing system and the Audio DJ. The large keyboard is comfortable to use, but could do with better positive tactile feel. The touchpad is sensitive and accurate, and so are the buttons. Weighing around 3.5 Kg, it's 45 mm thick and has great build-quality. Its temperature did not exceed 38 degrees Celsius even after 12 hours of use.

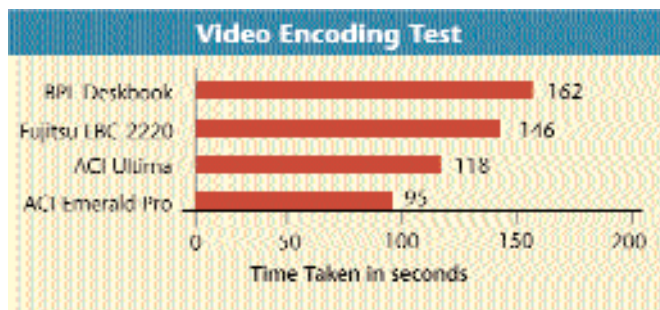
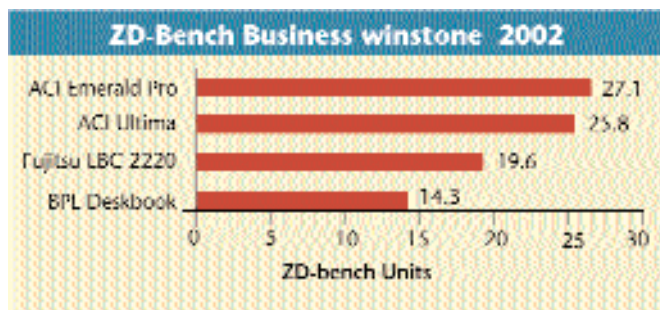
It was on par with the ACi Ultima in the CPU test but lost terribly in the memory scores indicating a bottleneck in the memory subsystem. Its hard disk scores were not impressive either. Due to the power optimised Pentium4 CPU, the battery life of the LBC 2220 was better than most models, lasting for more than 3 hours. The graphics subsystem scored poorly.

Priced at Rs 91,000, the Fujitsu LBC 2220 is expensive, but has good features, solid build quality and great ergonomics. We recommend it to those who want style at any cost.



Fujitsu LBC 2220	C+
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 91,000
 + Gorgeous looks, long battery life
 - Quite expensive



Conclusion

The desktop replacement category consisted of some of the best laptops in terms of performance, and a price tag ranging from as low as Rs 62,000 to a huge Rs 1,20,000. Though quite expensive when compared to a desktop PC it certainly offers some advantages of its own. Both the models from ACi were absolute fire crackers in terms of performance, and blasted the others to teeters. The Fujitsu, on the contrary, was a much balanced offering with great looks and decent performance. The only let down in this category was the BPL DeskBook, which has its existence firmly rooted in the true desktop replacement theory, indicated by the lack of any batteries.

The ACi Ultima was undoubtedly the winner—the USP of this laptop being the presence of wide-format 17-inch screen (great for multi-tasking with numerous applications), the rock solid performance and a very good hardware portfolio. The Emerald Pro, on the other hand, beats the gun out of every other laptop. With the hyper-threaded chip used in the laptop you are never out of juice for any system intensive-application. The price tag of Rs 74,000 is quite reasonable, and offers maximum bang for the buck, making it our value for money champion. We would like to see some better clothing for these laptops, which would definitely improve their visual appeal; some relief on the thermal issues that keeps cropping up would be nice too!

THE ULTIMATE PLACE FOR LAPTOP ACCESSORIES


USB Hub


Laptop Bag


Firewire/FMPCIA Adapter for modern & vintage card


USB Docking Station


Optical USB optical mouse for laptop


Adapter AC Charger (AC Charger)


USB Infrared Port (IR) (IR) adapter




Firewire Adapter for CD/DVD/Power Drive DVD/CD/Power


Laptop Battery


USB Camera


USB Fan


Computer lock


Laptop Hard Disk Drive & Memory

USB & FIREWIRE Products Also Available

For further information visit on - www.click.com, www.jugoo.com, www.leadselectronics.com, www.beecom.com, www.alpha.com

J.S. Equipments

G11, Ground floor, Matru Mandir, 278, Tardeo Road, Bombay-7
 Tel: 23810713/0718/23871741 Fax: 23860976
 email: jse@vsnl.com

All logos and trademarks are property of their respective companies

CATEGORY
DESKTOP REPLACEMENT

Brand	ACI	ACI	BPL	Fujitsu
Model	Emerald Pro	Ultima	DeskBook	LBC 2220
Processor (Type and Speed)	Pentium 4 3.06 GHz	Pentium 4 2.26 GHz	Pentium 4 1.5 GHz	Pentium 4 M 2.2 GHz
Memory (amount)	512 MB	1 GB	128 MB	256 MB
LCD Display Screen size (Inches)	15	17	15	14
Hard disk (Capacity / Speed in rpm)	40 GB / 4,200	80 GB / 4,200	40 GB / 5,400	30 GB / 4,200
Graphics adapter	Mobility Radeon 9000	Mobility Radeon 9000	Intel 845	Radeon IGP
Optical drive	Combo	Combo	DVD-ROM	Combo
Sound card	RealTek AC97	RealTek AC97	AC97	ALI AC97
Ports (USB/Serail/parallel/Firewire)	3 USB/✓/✓/✓	3 USB/✓/✓/✓	4USB/✓/✓/✓	4 USB/✓/✓/✓
Connectivity (IrDA,WiFi etc,LAN,Modem)	✓/✗/✓/✓	✓/✗/✓/✓	✗/✗/✓/✓	✓/✓/✓/✓
Audio-Video OUT options	Monitor D-SUB and S-Video	Monitor D-SUB, S-Video and CATV in	Monitor D-SUB and S-Video	Monitor D-Sub and S-video
Mouse Touch pad and No of buttons	✓ / 2	✓ / 2	✓ / 2	✓ / 2
No of Shortcut keys	3	3	3	2
Extra Batteries provided	✗	✗	✗	✗
Compact Flash slots (nos)	1	1	2	2
Miscellaneous	Integrated Web camera	Web camera, TV tuner card remote control	Flash Memory card reader	Flash memory card reader and Audio DJ
Usability (15%)				
Dimensions (L x W x H) (mm)	322 x 270 x 35	380 x 270 x 40	350 x 300 x 50	315 x 260 x 45
Weight (Kg)	3.4	4.1	4.25	3.5
Extra Input Devices (Scroll, pointing stick)	2 scroll buttons	2 scroll buttons	scrollpad	2 scroll buttons
Build Quality (S05)	3	3.5	3.5	4
Mouse Touchpad sensitivity (S05)	3.5	3.5	3.5	3.5
Keyboard Touch and feel (S05)	3	3	3	3.5
Overall Ergonomics (S05)	2.5	3	2.5	3.5
Built-in speaker Quality test (S05)	2.5	3.5	2.5	3.5
Temperature				
Ambient Temp (degree Celsius)	26	26	26	26
Laptop under surface (degree Celsius)	40	45	32	38
Operating System bundled	✗	✗	✗	Windows XP Professional
Office application suite	✗	✗	✗	✗
Other software & applications provided	Roxio and powerDVD	Roxio and powerDVD	Norton Antivirus 2003, powerDVD	✗
Recovery CDs	✗	✗	✗	✓
Accessories (carry case,docking station,etc)	Carry case and power adapter	Carrycase, power adapter	Power adapter	Carry case, power adapter
User guide	✓	✓	✓	✓
Overall System benchmark				
ZD-Bench Business winstone 2002	27.1	25.8	14.3	19.6
Video Encoding Test (Seconds)	95	118	162	146
Si soft Sandra (CPU test)				
CPU Dryhstone	9,515	5,818	4,007	5,738
CPU Whetstone	2,639	1,270	835	1,261
Multimedia - CPU Integer	14,148	8,931	5,969	8,729
Multimedia - FPU SSE	22,588	11,372	7,575	11,112
Memory test				
ALU / RAM (Int)	1,949	1,828	1,740	1,100
FPU / RAM (Fit)	1,951	1,827	1,763	1,103
File system test				
Drive Index (MBps)	11,624	17,805	24,703	12,911
Sequential Read (MBps)	16	26	36	18
Random Read (MBps)	4	5	7	4
Sequential Write (MBps)	16	26	36	17
Random Write (MBps)	4	6	2	7
Average access time (ms)	11	11	7	11
Quake3 Arena (fps)				
Normal (640 x 480 x 16)	258	210	80	40
High (800 x 600 x 32)	221	197	50	32.6
Max (1024 x 768 x 32)	143	143	13	24
3D Mark2001 SE	6,797	6,540	Failed	886
Displaymate assorted test (S05)	3.5	3.5	3.5	3
MobileMark 2002 Battery Test	2 Hrs 11 Min	2 Hrs 6 Min	No battery	3 Hrs 53 Min
Performance (45%)	32.60	30.26	14.61	22.86
Features (35%)	22.70	28.70	22.70	26.80
Usability (15%)	8.10	9.60	8.10	10.10
Package content (5%)	2.00	2.00	2.00	4.00
Overall	65.40	70.56	47.41	63.76
Value for money	3.76	2.50	3.26	2.98
Grade				
Price (Rs)	73,990	1,20,000	61,900	91,000

TABLET PCS

The latest buzz in mobile computing are tablet PCs. The concept conceived by software giant Microsoft, and these devices are a cross between palm tops and laptops. A tablet PC allows you a palmtop-like input facility via a stylus and the touch sensitive LCD screen. Tablets are often used in hospitals, where the doctor can access prescription data of a particular patient while taking rounds, or in manufacturing and construction sites to glance quickly through any required information.

Such work places demand devices that are portable and can be handled comfortably. Dimensions, weight and configuration

are the factors that determine the cost of a Tablet. There are currently two types of tablet PCs available: the stand-alone models that are true tablets, and the convertibles. This can also masquerade as a laptop. The weight of these devices is usually between 1.5 Kgs to 2.5 Kgs. The true tablets have no moving parts and are robust, the apparent mechanical complexity of the convertibles makes them delicate gadgets. One more aspect that makes tablets different from laptops is the use of smaller LCD displays—12-inch displays are the norm.

Acer C110

Baby's day out

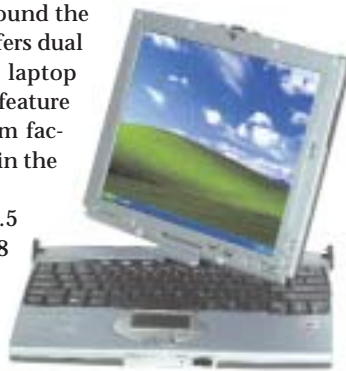
The Acer C110 is built around the convertible idea, and offers dual functionality as both a laptop and a tablet. Its most striking feature is the amazingly compact form factor. This was the cutest device in the comparison.

The C110 weighs a mere 1.5 Kgs and measures 25 x 21 x 28 cms, making it the lightest and smallest tablet in the comparison. It may be small, but in no way is it underpowered. The 10-inch LCD display is clear and crisp with a good viewing angle. It has a Pentium M 900 MHz processor but comes with 512 MB of DDR RAM to make up for the low-processor speed. Despite the small size, Acer manages to cramp in a 40 GB hard disk, and as it runs on the Centrino platform, it also offers wireless connectivity.

The keyboard is comfortable as it is arc-shaped. The keys are small, but comfortable, and have good tactile feedback. The touchpad is small and quite cumbersome to use. To change to the tablet mode, you need to unlock the clamps holding the screen on the sides, and twist it and fold it flat. The locking mechanism for the screen is quite flimsy. The hotkeys are perfectly placed within easy reach of your fingers, as is the stylus.

The C110 showed signs of being under-powered in the CPU and hard disk tests. However, the memory subsystem is excellent—it beat the Toshiba 3500's SD-RAM subsystem convincingly. The graphics performance was certainly the best amongst the lot, courtesy the latest generation on-board graphics by Intel.

At Rs 1,59,990, the Acer C110 is better priced than the Toshiba tablet. Only its no-so-elegant looks and flimsy build quality were disappointing, but at such a good price, it is the better option.



Price: Rs 1,59,990
 + Extremely portable, good configuration
 - Needs a better build quality

Acer C110 C	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

ACi Tablet

The elephant ballet

This convertible tablet PC from ACi is like a pickup truck—massive, relatively ugly and slow. The tablet weighs around 2.5 Kg and measures a bulky 315 x 260 x 30 cms. The LCD display measures a full 14-inches, which is considered monstrous for a Tablet PC. With such dimensions and weight, the very purpose of a tablet seems to be lost.

Aesthetically, the steel grey finish and the chrome lining make the product look cheap. The interior has black keys and dark grey panels, contrasting with the pool of chrome and grey plastic.

Ergonomically, the keyboard is well spaced out and comfortable. The shortcut buttons for the tablet mode are placed on the sides. You have to get used to them and know exactly where each one is, before they even begin to be 'shortcut' keys.

The ACi tablet has a VIA Nehemiah 1 GHz processor, with 256 MB of RAM, a measly 20 GB hard disk and an onboard SiS adapter as the graphics card. The tablet comes with just two USB ports—all legacy ports are missing. However, other features such as flash memory card reader, external USB DVD-ROM, external floppy drive and compact flash reader are provided.

Via processors have weak FPU's, and the pathetic FPU score in the Sisoft Sandra CPU test and below par gaming benchmarks proved that. It was the lowest scorer of all in the Business Winstone test. Moreover, ACi does not bundle Windows XP Tablet Edition, making us wonder why they called it a tablet in the first place.

Though it's priced at just Rs 69,990, you'll have to shell out extra to get a tablet edition OS. The ACi Tablet is cheap, looks the part and absolutely fails to deliver where it matters.



Price: Rs 69,990
 + Large screen
 - Poor performance, quite bulky

ACi Tablet A	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

CATEGORY	TABLETS PCS		
Brand	Toshiba	Aci	Acer
Model	Portege 3500	Tablet	Tablet
Processor (Type and speed)	Pentium III M 1.3 GHz	VIA Nehemiah 1 GHz	Pentium M 900 Mhz
Memory (Amount)	256 MB	256 MB	512 MB
TFT Display Screen size (Inches)	12	14	10.4
Hard disk (Capacity / Speed in rpm)	40 GB / 4,200	20GB / 4,200	40 GB / 4,200
Graphics adapter	Trident CyberALADDiN-T	VIA S3G	Intel 855
Optical drive	✗	External Combo	✗
Sound card	SoundMax Digital audio	VIA AC97	CMI AC'97
Ports (USB/Serail/parallel/Firewire)	2 USB/✗/✗/✓	2USB/✗/✗/✗	2 USB/✗/✗/✓
Connectivity (IrDA,WiFi etc,LAN,Modem)	✓/✓/✓/✓	✓/✗/✓/✓	✓/✓/✓/✓
Audio-Video OUT options	Monitor D-SUB	Monitor D-SUB	D-sub
Mouse Touch pad and No of buttons	✓ / 2	✓/2 buttons	touchpad, 2 buttons and scroll pad
Shortcut keys on keyboard	✓	✗	4 buttons, 5 tablet buttons
Extra Batteries provided	✗	✗	✓
Compact Flash slots (nos)	2	1	1
Miscellaneous	Flash memory card reader	Memory Card Reader and External FDD	Special LCD cleaning Fabric, Extra stylus tips
Usability (20%)			
Dimensions (L x W x H) (mm)	295 X 234 X 32	315 x 260 x 30	250 x 215 x 28
Weight (Kg)	2	2.5	1.5
Extra Input Devices (wheel, pointing stick)	✗	✗	✗
Build Quality (S05)	3	3	2.5
Keyboard Touch and Feel (S05)	3.5	3	3
Mouse Touchpad sensitivity (S05)	3.5	3.5	3
Overall Ergonomics (S05)	3	2.5	2.5
Built-in speaker Quality test (S05)	3	3.5	3
Temperature			
Ambient Temp (degree Celsius)	26	26	26
Laptop under surface (degree Celsius)	38	38	39
PACKAGING (10%)			
Operating System bundled	Windows XP Professional	✗	Windows XP Home Edition
Office application suite	✗	✗	✗
Other software & applications provided	Toshiba control utilities	Roxio Easy CD creator and Power DVD	Tablet PC softwares
Recovery CDs	✓	✗	✓
Accessories (carry case,docking station,etc)	Power adapter	Carrycase and power adapter	Carrycase, power adapter and extra battery
User guide	✓	✓	✓
Overall System benchmark			
ZD-Bench Business winstone 2002	17.1	13.4	19.9
Video Encoding Test (seconds)	168	277	130
Si soft Sandra: CPU test			
CPU Dryhstone	3,625	1,603	2,992
CPU Whetstone	1,789	369	1,208
Multimedia - CPU Integer	7,001	2,207	5,142
Multimedia - FPU SSE	8,772	2,511	5,977
Memory test			
ALU / RAM (Int)	564	765	1,660
FPU / RAM (Fit)	552	426	1,687
File system test			
Drive Index (MBps)	14,721	11,552	9,046
Sequential Read (MBps)	22	16	12
Random Read (MBps)	4	4	3
Sequential Write (MBps)	19	16	12
Random Write (MBps)	4	4	3
Average access time (ms)	12	11	12
Quake III Arena (fps)			
Normal (640 x 480 x 16)	26	31	100
High (800 x 600 x 32)	16	20	65
Max (1024 x 768 x 32)	8	14	36
3D Mark2001 SE			
Displaymate assorted file test (S05)	3	3	3
MobileMark 2002 Battery Test	2 Hrs 10 Min	2 Hrs 13 Min	2 Hrs 20 Min
OVERALL SCORE			
Performance (35%)	24.90	22.22	28.06
Features (35%)	18.90	16.50	21.40
Usability (20%)	11.90	10.30	12.40
Package content (10%)	6.50	4.00	6.00
Overall	62.20	53.02	67.86
OTHER			
Value for money	1.8	4.5	2.5
Grade			
Price (Rs)	2,04,999	69,990	1,59,990

Apple G4 powerbook

One look at the new Apple PowerBook, and you're sure to fall in love with it. Apple products are known for their unique styling, and this baby is no exception; everything spells pizzaz.



Discarding the old titanium cover, the G4 is dressed in silver-coloured aluminium casing. Tipping the scales at 2.6 Kgs, it's slightly heavy, but not uncomfortably so. The wide 15-inch LCD is more than enough, and a DVI connector offers connection to any external digital monitor, or projection device. The plethora of connectivity options available on the PowerBook is something to talk about—two USB 2.0 ports, a standard (IEEE 1394) FireWire and another FireWire 800 (IEEE 1394b). This was the only laptop with an IEEE 1394b port. Similarly, the PowerBook has a high speed Gigabit Ethernet connector, a phone jack (RJ-11) and an optional Airport Extreme card for wireless connectivity.

The slot loading SuperDrive is a boon to the mobile user—just slide in the CD, and go about your business. The backlight disregards poor lighting conditions, and sensors detect the ambient light and adjust the backlight—of the LCD and the keyboard—accordingly. The only disappointment came in the form of the jerky trackpad.

Under the sleek hood, is a G4 1.25 GHz processor and 512 MB RAM. Mac OS X version 10.2.5 combines the ease of use of a Mac, with the stability of Unix, and has almost every imaginable application pre-installed—iTunes, iMovie, iDVD, speech recognition software, etc. The system lasted only two hours and 40 minutes on a full charge.

At close to Rs 1.77 lakh, this stunner is sure to wrench your heart out through your wallet. But once you have it, remember to flaunt it at every possible occasion!

ULTRA-PORTABLES

Ultra-portable laptops are for frequent fliers who need an extremely light and small device. They are made keeping size in mind, and hence do not perform as well as their bigger siblings—the thin and light laptops. They are small and light enough for you to lug them around the whole day without tiring yourself. Ultra-portables usually have LCD screens measuring not more than 12 inches; the ones with a 10-inch screen are termed sub-notebooks.

Their small size results in poor ergonomics and the keys might end up giving you sore fingers. These small machines are

PnP Ultra-portable laptop

Processor weak

The PnP ultra-portable laptop was based on the VIA Antuar platform. The compact dimensions of this notebook compelled us to put it in the ultra-portable category. It weighs just 1.4 Kgs and measures a mere 27 x 21 x 25 inches. It comes with a 1 GHz VIA Nehemiah CPU, 256 MB of RAM, a 40 GB hard drive and an S3 graphics core. No legacy ports are available, but you get two USB ports and a Firewire port for data transfer.



It has a reasonably large keyboard that is well spaced out for comfortable typing. The keys are extremely responsive. The touchpad is sensitive and track true, while the accuracy is spot on. The ports are ideally placed for easy and unhindered usage.

The off-black finish and subtle use of silver at the base of the lid lend it a stern character. The same theme continues on its inside and makes it stand out from the rest of the crowd.

VIA processors are never known to be powerhouses, and the same is reflected in the FPU scores, which is the weakest on all VIA processor. This weakness was also reflected in all the graphics benchmarks such as *Quake III* and 3D Mark 2001 SE. The hard disk holds up to the demand quite well. The battery life is, as usual, near the 3-hour mark.

Given its configuration, it's priced expensively at Rs 69,999. Its only USP is its extremely low profile design that makes it light and compact. It gets most of your light work done in a jiffy, but crawls along when faced with any processor-intensive tasks. We recommend it to those on the lookout for an extremely light and ultra-portable laptop at an affordable price.

PnP Ultra-portable laptop A-	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 69,999
 + Extremely light and portable
 - Expensive for its configuration

mainly used to work with Word processors, make Powerpoint presentations and check e-mail while on the move. Previously, many of these laptops used Intel's PIII range of processors. However, the new breed has adopted the latest Centrino mobile technology that offers inbuilt wireless connectivity, longer battery life and sleeker designs, without compromising on performance. The batteries on the new Centrino models last for at least 3 hours; pre-defined power schemes such as Presentation, Movie, etc, extend that period to 4 hours.

Toshiba Portégé M100

Raise a toast

The Toshiba Portégé M100 was the only true ultra-portable that made it to this comparison. Based on the latest Centrino technology, it packs a lot of punch in its small body. The M100 looks terrific in its champagne-coloured outfit.



Black side panels line the crisp 12-inch TFT LCD. The jet-black keyboard and the blue track point contrast well with its gold colour. The top lid is hinged to the centre of the base, while the chubby speakers protrude out at its extremities.

The keys are fairly spaced out, and you don't fumble while typing. Our only gripe was the positioning of the Windows key with the function keys at the top of the keyboard. A pointing stick along with four buttons fills in for the touchpad. The placement of these buttons with respect to the pointing stick is perfect, and does not require you to stretch your fingers. Weighing 1.9 Kgs and measures 26.5 x 24.5 x 35 inches, which is quite compact. Despite being that small, it manages to offer a combo-drive.

In the overall system benchmark that used Business Winstone, the M100 delivered an astounding 25 units—the best score you can get on an ultra-portable. This can be attributed to the Pentium M 1.2 GHz CPU that uses the Centrino platform. Similar results were seen across the board, indicating the presence of high-performance hardware. The 40 GB hard drive delivered a commendable performance. The graphics sub-system is powerful enough to get along with most of the old 3D games. The batteries lasted for about 3 hours. Use a power scheme and you gain an extra hour.

For an ultra-portable, Rs 1,79,999 is expensive, but it's the best compact travel companion that money can buy.

Toshiba Portégé M100 C-	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Usability	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Price: Rs 1,79,999
 + Great looks and good performance
 - Slightly cramped keyboard

SCORE BOARD

CATEGORY	ULTRA PORTABLES	
	Toshiba	PnP
Brand	Toshiba	PnP
Model	Portege M100	Ultra portable
Processor (Type and speed)	Pentium M 1.2 GHz	Via 1 Ghz Nehemiah
Memory (Amount)	256 MB	256 MB
TFT Display Screen size (Inches)	12	12
Hard disk (Capacity / Speed in rpm)	40 GB / 4,200	40 GB / 4,200
Graphics adapter	Intel 855	VIA S3
Optical drive	Combo	X
Sound card	SoundMax Digital audio	SoundMax Digital audio
Ports (USB/Serail/parallel/Firewire)	2-USB/X/X/✓	2-USB/X/X/✓
Connectivity (IrDA,WiFi etc.,LAN,Modem)	✓/✓/✓/✓	X/X/✓/✓
Audio-Video OUT options	Monitor D-SUB	Monitor D-SUB and S-Video
Mouse Touch pad and No of buttons	No- four button track point	Yes 2 buttons/ scroll
No of Shortcut keys	2	3
Extra Batteries provided	X	X
Compact Flash slots (nos)	2	2
Miscellaneous	Flash memory card reader	X
Usability		
Dimensions (L x W x H) (mm)	265 X 245 X 35	270 x 210 x 25
Weight (kg)	1.9	1.4
Extra Input Devices (wheel, pointing stick)	X	2 scroll buttons
Build Quality (S05)	4	3
Keyboard Touch and Feel (S05)	3.5	3
Mouse Touchpad sensitivity (S05)	3	3
Overall Ergonomics (S05)	4	2.5
Built-in speaker Quality test (S05)	3.5	2.5
Temperature		
Ambient Temp (Degree celsius)	26	26
laptop under surface (Degree celsius)	39	38
PACKAGING (10/9)		
Operating System bundled	Windows Xp professional	X
Office application suite	X	X
Other software & applications provided	Toshiba control utilities	X
Recovery CDs	✓	X
Accessories (carry case,docking station,etc)	Power adapter	Power Adapter and Carrycase
User guide	✓	✓
Overall System benchmark		
ZD-Bench Business winstone 2002	25.7	14
Video Encoding Test (seconds)	102	333
Si soft Sandra : CPU test		
CPU Dryhstone	4019	1606
CPU Whetstone	1611	370
Multimedia - CPU Integer	6838	Failed
Multimedia - FPU SSE	7948	Failed
Memory test		
ALU / RAM (Int)	1635	472
FPU / RAM (Fit)	1642	306
File system test		
Drive Index (MBps)	16,876	15,405
Sequential Read (MBps)	24	22
Random Read (MBps)	5	3
Sequential Write (MBps)	23	22
Random Write (MBps)	6	6
Average access time (ms)	9	13
Quake III Arena (fps)		
Normal (640 x 480 x 16)	110	43
High (800 x 600 x 32)	64	Failed
Max (1024 x 768 x 32)	28	Failed
3D Mark2001 SE	1820	331
Displaymate assorted file test (S05)	3	2.5
MobileMark 2002 Battery Test	2 Hrs 55 Min	2 Hrs 13 Min
OVERALL SCORE		
Performance (35%)	29.1	19.0
Features (35%)	27.2	20.3
Usability (20%)	13.5	14.4
Package content (10%)	7.0	3.0
Overall	76.8	56.7
OTHER		
Value for money	2.1	4.0
Grade	C	A
Price (Rs)	1,79,990	69,999



Double Benefit Offer

ZEN Digital Wireless KB + Mouse
Rs. 2,750/-

20% Off
Give Back Old &
Get Rs. 100/- Off



20% Off
Give Back Old &
Get Rs. 50/- Off



ZEN Optical Mouse (PS/2)
Rs. 600/-

TURN ON

One Stop Computer Shop
At Your Service Since 1991

Regd. Office : 91/96, Bore Bazar St., 1st Floor, Fort, Mumbai-400001.
Tel : 2262 0444 / 2265 9410.
Email: turnon@vsnl.com • www.zenthemaster.com

Imported by : H. T. IMPEX

INDIA'S LARGEST WELL-EQUIPPED LAPTOPS & PROJECTORS SERVICE CENTRE FOR ALL BRANDS UP TO CHIP LEVEL



LAPTOPS



PROJECTORS

SPARE PARTS AND PERIPHERALS FOR PROJECTORS & LAPTOPS

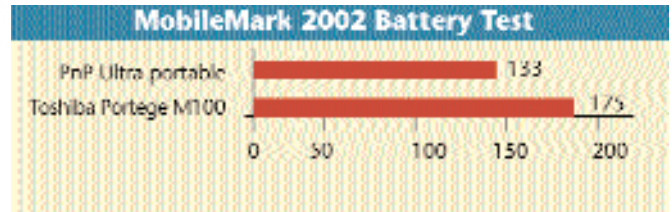
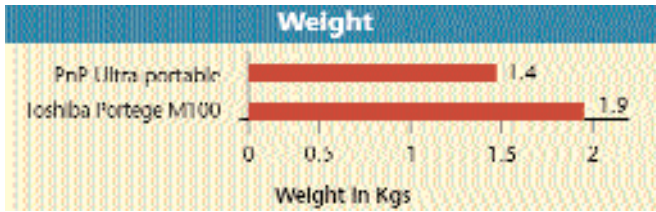
APPROVED VENDORS BY MNC'S, CORPORATE & PUBLIC SECTORS FOR SERVICE CONTRACTS

Call now for special rates on AMC contracts and pre/after sales service on all makes of Projectors & Laptops

For Corporates only
Free service camp & latest technology awareness programme on laptops & projectors at your door step

READY TO BE OUR FRANCHISEE ???
INVITING ENTREPRENEURS FOR BEING OUR FRANCHISEE TO SHARE OUR SUCCESS

SHREE SATGURU INDUSTRIES
173, Udayog BHAVAN, SUNAWALA ROAD, GOHESGAON E, MUMBAI - 400 063
Mumbai: 56992415/16/28711783/85 Fax: 28717173
Pune: 020-4024150/34024150
Email: ralco@vsnl.com



Decision Maker

	Laptop for your desk	An office laptop	Laptop for travellers	Laptops for flaunting
You need:	A reasonably well-powered laptop that can replace your desktop PC, and provide the same amount of processing power with some battery backup	A sturdy, light, decently configured laptop that can run most of your office, and also has wireless connectivity. Centrino based laptops would be great choice	An extremely light, portable laptop that can be used anywhere, is easy on shoulders and allows you to do most of your office work plus browsing Via hotspots	A laptop that looks like a dream, has a high flaunt value and differentiates you from the crowd
Look for:	Processor above 2 GHz, with atleast 512 MB of RAM, a decent ATI or nVidia based graphics adapter, 60 GB above hard disk space and array of connectivity options	A laptop with 1.4 GHz Pentium M processor, at least 256 MB of RAM, 40 GB hard disk and a battery life of more than three hours	Anything that weighs 1.5 Kgs or less, is built around the Centrino platform and at least three hours of battery life	Tablets or convertibles laptops, with certain exceptions in mainstream laptops
Our pick:	Aci Ultima, Aci Emerald Pro, Dell Inspiron 1100 and Fujitsu LBC 2220	IBM T40, HP-Compaq Nx9000, Wipro Little genius and Zenith 4x	Toshiba M100, IBM T40 and PnP laptop.	Toshiba Portege 3500, Acer C110 and Hp-Compaq nx-9000
Price:	Rs 74,000 to Rs 1,25,000	Rs 70,000 to Rs 1,75,000	Above Rs 1,00,000	Above Rs 1,50,000

Contact details

Brand	Aci	Acer	Apple	BPL
Contact	ACI Asia Ltd	Acer India Pvt Ltd	Apple Computer International Pvt. Ltd.	XServe India Pvt Ltd
phone	022-56943260 / 56407000	080 5219531-34	080-5550575	080-5572601/02
Fax	022-26733119	080 5219537	080-5550660	080-5572603
Email	sales@aci-asia.com	diptarup_chakraborti@acer.co.in	indiainfo@asia.apple.com	info@xserves.com
Website	www.aci-asia.com	www.acer.com	www.apple.com	None

Brand	Fujitsu	IBM	Hp-Compaq	Wipro
Contact	Aci infocom Ltd	IBM India Ltd	Infobahn Technical Solutions India Ltd	Wipro Ltd
phone	022 - 2826 6031/32	080 2063199	022-28500821	080-8440011
Fax	022 - 28250674	080-2063702	022-28511681	080-8440031
Email	sales@aciinfo.com	sanmenon@in.ibm.com	info@infobahnindia.net	littlegenius@wipro.com
Website	www.fujitsu.com	www.ibm.com	www.hp.com	www.wepindia.com

Brand	Toshiba	Zenith	PnP	Dell
Contact	HCL Infosystems Ltd	Zenith Computers Ltd	Plug N Play Technologies	Dell Computers Asia Pvt Ltd
phone	0120-4544534	022-28377300	022- 5634 8784	1-600-33-8044
Fax	0120-4533877	022-28377297	022-5634 0276	080-5586107
Email	notebook@hclinsys.com	one-up@zenith-india.com	sales@plugnplaytech.com	marketing_response@dell.com
Website	www.toshiba.com	www.zenith-india.com	none	www.dell.com

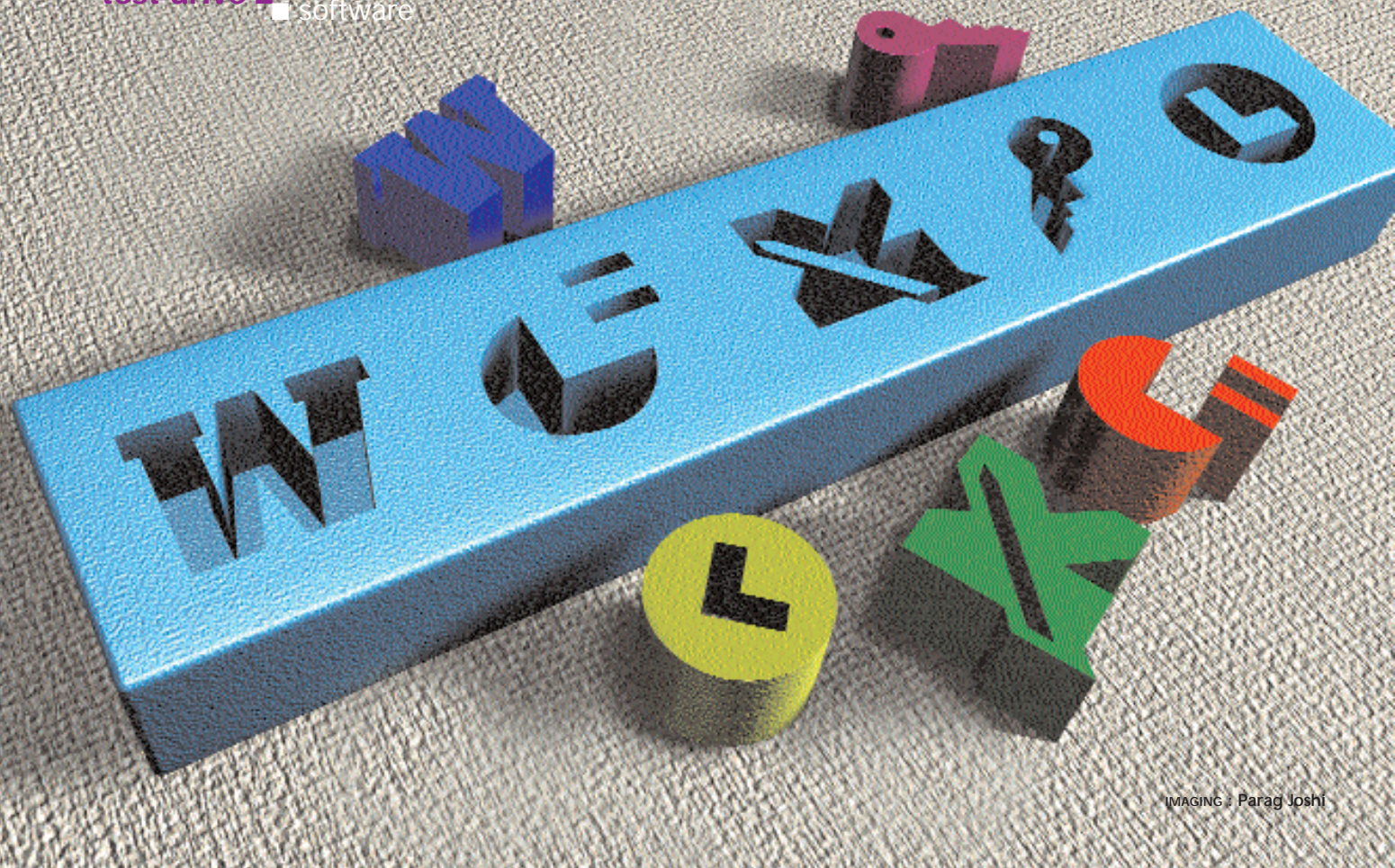
Conclusion

Ultra-portables are made with one purpose in mind—portability for frequent travellers. Miniaturisation leads to increase in the price, and hence these devices are very expensive, making them quite a rare commodity. But the scene is changing rapidly, and nearly all vendors such as IBM, HP-Compaq, Dell, Toshiba, etc., have come out with a range of ultra-portables based on the new Centrino platform. This platform offers smaller chips with higher processing power and lower power consumption. It also offers wireless connectivity, thus greatly improving any mobile device that runs on Centrino. The Toshiba M100 featured in this shoot-out was the only ultra-portable from a reputed brand; the PnP brand laptop, on the other hand, comes from an Indian vendor who assembles them in India, and currently has a presence only in Mumbai.

The Toshiba M100, despite being an ultra-portable, had some distinct features such as the inclusion of the optical drive with-

out significant increase in the bulk, the champagne finish and exclusion of touchpad. On the pure performance stake, it betters even the thin and light category winner IBM T40 and there is no doubting its abilities when it comes to the task. The omission of the touch pad was felt badly initially, but the well placed track point compensated for the loss. The price of the M100 is a bit steep, but that's what they cost. Whereas on the other hand, the PnP laptop just can't match the Toshiba in either performance or features. This was the only laptop weighing below 1.5 Kgs, and allows great mobility. The PnP does its job, provided you use it as it was meant to be—any diversion here and there, and it will go bonkers. You can probably get a laptop with a much better configuration for the same price, but nothing that will offer you the same portability. ■

SANKET NAIK
sanket_naik@thinkdigit.com



IMAGING : Parag Joshi

IN SUITE PURSUIT

You can save a bundle by opting for an alternative to MS Office, but will you be able to exchange files with the MS Office users all around you? We test five of the best Office alternatives for exactly this...

Office productivity applications have an importance that simply can't be ignored. It wouldn't be an overstatement to say that offices can't survive without a decent set of these applications. And the moment you think of office suites, the one that comes to mind is Microsoft Office—the undisputed market leader. Heavy price tag, and frequent upgrade cycles have prompted MS Office users to look at alternatives. Their major concern is the compatibility of these alternatives with the native MS Office file formats of .doc, .ppt, and .xls.

There have always been arguments as to why other office suites should have MS Office compatibility built into them. And while different people have different opinions on this, it's reasonable for organisations and individuals to expect a fair amount of compatibility from

these suites. The reason for this is that even if the native file formats of these applications are superior to those of MS Office, people still have to be able to work with existing office documents, which will, without a doubt, be in MS Office formats.

Our purpose here is to evaluate the level of compatibility offered by various alternative suites with MS Office XP files.

The office suites we picked for this test were the best alternatives to be found currently across multiple operating systems—Windows or Linux, to be precise. A few years ago, this test would not include any Linux office software, because of their rudimentary support for MS Office file formats. But now, with products such as StarOffice and OpenOffice.org coming up on Linux, this is no longer the case. A brief introduction to all the contenders follows:

StarOffice 7: StarOffice 7 is based on the OpenOffice.org project. In the Word documents test, it performed similar to OpenOffice.org; it had the good as well as the bad features. For one, it takes ages to load and keeps on popping up extra untitled documents each time a new document is opened.

OpenOffice.org 1.1.0: OpenOffice.org 1.1, a free downloadable (www.openoffice.org), is a major improvement over previous versions. The current version incorporates several features from StarOffice 7. The results, therefore, were quite similar to what we got with StarOffice 7.

Ability Office: Ability is an office software suite which includes packages that help increase productivity. The said packages include Write, Spreadsheet, Database and Photopaint. Except for the



How We Tested

Compatibility among applications can be judged on two grounds: functional and procedural. Functional compatibility is the ability of the software to emulate the functional capabilities of other software. Procedural compatibility is the software's ability to enable one to do the same job, using similar steps. Functional compatibility is required to ensure that the software works with the existing application. Procedural compatibility, on the other hand, reduces the time required to re-train oneself when migrating to the new application. Here, we only tested the functional compatibility of the alternative suites with MS Office. Hence, the testing concentrated on the ability of the alternative suites to open existing Word, Excel and PowerPoint files, make changes to them, save them and finally, let them open again in MS Office. The files were created to take into consideration the limitations that vendors face while ensuring MS Office compatibility. We therefore included only a bare minimum of the set of features that MS Office offers, compatibility with which is essential in any office environment. The more advanced of features were left out.

The test documents came under two categories: ones that were created by us, and ones that were downloaded from the Internet. The ones downloaded from the Internet contained a lot of graphical diagrams and mathematical equations. The mathematical equations range from very simple ones to highly complex nested equations.

Each document that opened without any errors scored five points; those with minor errors scored three points; those with major errors, but which were still operable got one point; while documents which were unopenable scored zero for the suite.

Word Processors: In the case of word processors, text formatting is very important. So, the main test document consisted of text written in a variety of fonts, with varying font sizes and formatting. In certain places, the background and foreground colours were reversed. Almost all the other test documents had images, screenshots and diagrams, and the ability of the word processor to display these was tested. In total we tested each suite with 10 documents. Some screenshots had callouts describing the various components, and

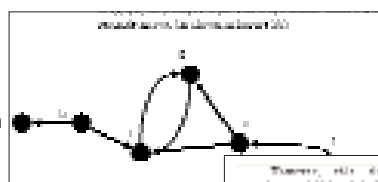
the ability of the applications to render these was also tested. In total, there were

Spreadsheets: Here, correct reproduction of formulas and embedded graphs was given top priority. We used nine documents to test this category. Many of the test documents were designed to test the ability of the applications to open multiple worksheets in a single spreadsheet. These had formulas referencing multiple worksheets, and also used graphs that were cross-referenced to other worksheets. One test spreadsheet had complex functions and basic Windows widgets (simple controls such as buttons) embedded. We didn't expect it to work on Linux-based applications—they were specifically meant for Windows.

Presentations: The PowerPoint presentation files were used to check the ability of the alternative presentation tools to correctly display the content of the slides. Both the quality, as well as the precision of the displayed slides, was evaluated. We used 12 presentations to test this category, one of which was designed to check the ability of the software to reproduce colours and transition effects. Another presentation tested graph capabilities. This presentation consisted of various types of graphs. It starts off

Classification of errors: Errors in documents were classified as fine, minor, major and unusable. Documents displayed with hardly any errors were listed as 'fine'; those with very few mistakes were listed as 'minor'. Slightly more complex errors that spoil the user experience were classified as 'major'. 'Unusable' errors were ones that rendered the document unusable.

For example, in the case of presentations, if the background image was not displayed in the same way as in the original, the error was considered as 'major', since the purpose



In word processors, slightly misplaced images were given less importance than completely misplaced ones



of putting a background image in a presentation is to reduce its prominence, and to give a subtle effect.

In the case of Word documents, the rules were slightly different. If, for example, an image was slightly misplaced, the error was classified as 'minor'. But if it was completely misplaced and, say, overlapped with the



Background images were given more importance while evaluating presentation software

with simple bar graphs, and proceeds towards more complex graphs. In each graph type, both a 2D as well as a 3D version of the same graph was used. Several slides had embedded foreground and background images, along with text displayed using sliding effects, and the correct reproduction of these was given weightage.

	Math 101	Math 102	Math 103	Math 104	Math 105	Math 106	Math 107	Math 108	Math 109	Math 110
Math 101	100	100	100	100	100	100	100	100	100	100
Math 102	100	100	100	100	100	100	100	100	100	100
Math 103	100	100	100	100	100	100	100	100	100	100
Math 104	100	100	100	100	100	100	100	100	100	100
Math 105	100	100	100	100	100	100	100	100	100	100
Math 106	100	100	100	100	100	100	100	100	100	100
Math 107	100	100	100	100	100	100	100	100	100	100
Math 108	100	100	100	100	100	100	100	100	100	100
Math 109	100	100	100	100	100	100	100	100	100	100
Math 110	100	100	100	100	100	100	100	100	100	100

Merged cells were given more importance since they indicate major categories, and contribute to the overall impact of the data

text, it was considered 'unusable'. However, in documents where the images were simple but highly relevant to the text, the absence of even a single image was considered an 'unusable' error.

In the case of spreadsheets, the ability of the software to correctly understand formulae and display embedded graphs was given more importance than minor formatting errors. But certain places where formatting was more relevant, such as cells merged to indicate common data under a single heading, were given high importance.



missing presentation tool, Ability Office has all the tools required for day-to-day office tasks.

Corel WordPerfect 11: Corel WordPerfect consists of three components—WordPerfect 11 is the word processor, Quattro Pro 11 is the spreadsheet tool and Presentations is the presentation tool.

Lotus SmartSuite 9.8: Lotus SmartSuite consists of a group of applications that also include office software. The office components include Lotus 1-2-3, WordPro and FreeLance Graphics. Apart from these, the other applications included are Lotus SmartManager, an information management tool; Lotus Approach, a database; Fastsite, a Web publishing application; and a time management tool called Lotus Organizer.

WORD PROCESSORS

StarOffice 7 Writer

Star of formatting

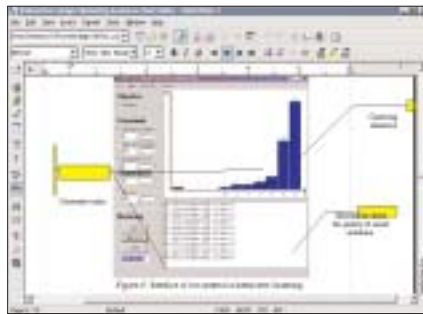
StarOffice Writer offered the best compatibility with MS Word documents. While the displayed text was not as crisp as in MS Word, there were very little formatting errors. It was also able to display a majority of the images and diagrams in the test documents. Strangely though, it had problems displaying some of the



StarOffice Writer managed to display almost all the embedded images, with decent quality



In spite of its good compatibility, StarOffice missed out on some of the diagrams



Callouts on embedded screenshots were not displayed properly

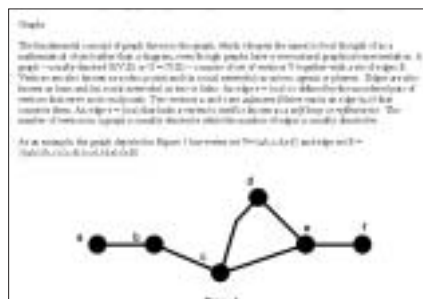
simple images that were similar to the ones it displayed perfectly. It also had problems displaying a majority of the callouts on the screenshots.

Ability Write:

Symbolically handicapped

Ability Write has good compatibility with documents that are a simple mix of text and images. The displayed text and formatting in Write was more or less similar to the one in the original document opened in MS Office, except that a few symbols were changed at some places. But it did have trouble displaying paragraph headings with exactly the same formatting.

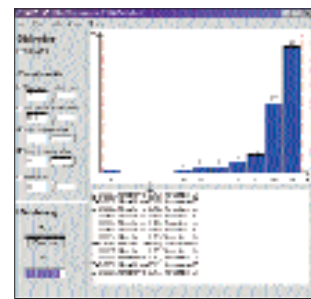
But there were other problems too. Ability Write couldn't properly align the bullet lists in some of the test documents, and had a problem displaying footnotes. The footnotes were displayed at the place



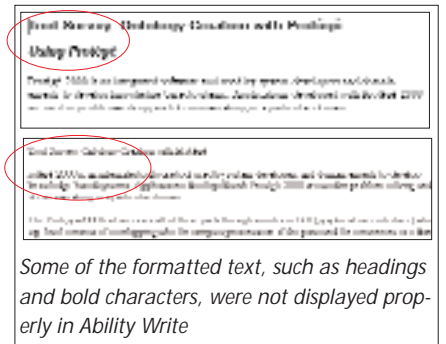
The text formatting and displayed images were generally good, except for headings and a few formulas



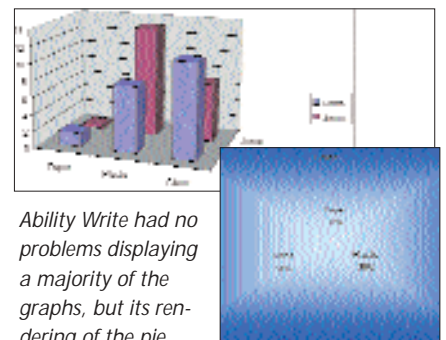
Footnotes were displayed in place, in between the text, instead of at the bottom of the page



The callout in this image was not visible in Ability Write



Some of the formatted text, such as headings and bold characters, were not displayed properly in Ability Write



Ability Write had no problems displaying a majority of the graphs, but its rendering of the pie chart was not satisfactory

of reference, rather than at the end of the page. A majority of the embedded images, too, were not displayed.

While bullet lists just had problems with alignment, the numbers in numbered lists were simply not increment—it showed '1, 2, 3' as '1, 1, 1'. One of the few images that were displayed didn't have proper labelling in place.

A peculiar problem observed in Ability office was that after continuously opening and closing a few documents, it could not open any more documents—they all opened up as blank documents. Restarting the application solved the problem. At places it had problems with formatting, it displayed several headings as normal text.

Ability Write could not hold it all together in a good way. While it displayed a majority of the embedded images and screenshots, it could not give the documents the same effect that MS Word gives. Overall, this is a product that

Region	2012	2013	2014	2015
North America	100	100	100	100
Europe	100	100	100	100
Asia	100	100	100	100
Africa	100	100	100	100
Oceania	100	100	100	100

Ability Office lost all the information that was contained in this table in one of the test documents

Region	2012	2013	2014	2015
North America	100	100	100	100
Europe	100	100	100	100
Asia	100	100	100	100
Africa	100	100	100	100
Oceania	100	100	100	100

could do with a few improvements.

Corel WordPerfect 11

Nearly perfect

WordPerfect renders text perfectly, and you can't differentiate it from the text displayed in Word. It also fared well in the document with the complex table.

The placement of images in the document was not always perfect, and in some cases it went completely haywire - so much so that the original image could not be identified. In the document used to test callouts on images, the image itself was not displayed properly, and callouts



A common problem with WordPerfect is complete distortion of diagrams within documents



The rendering of text and formatting was near-perfect in WordPerfect

were completely lost.

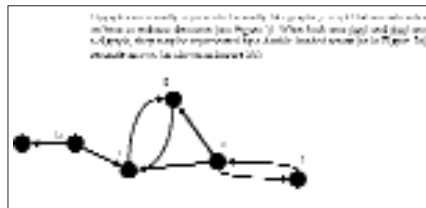
Lotus WordPro

Irresponsible with images

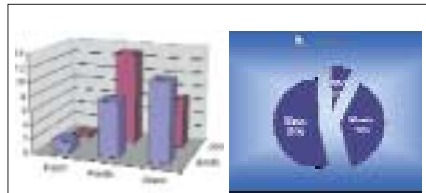
WordPro was able to display all the graphs in the test documents. Its rendering of the pie chart was the best among the lot, but it did goof up slightly on a simple bar graph. Text formatting, formulas, HTML links and placement of footnotes was also near-perfect. While it was able to display some of the embed-

Region	2012	2013	2014	2015
North America	100	100	100	100
Europe	100	100	100	100
Asia	100	100	100	100
Africa	100	100	100	100
Oceania	100	100	100	100

WordPerfect was able to render this complex table perfectly

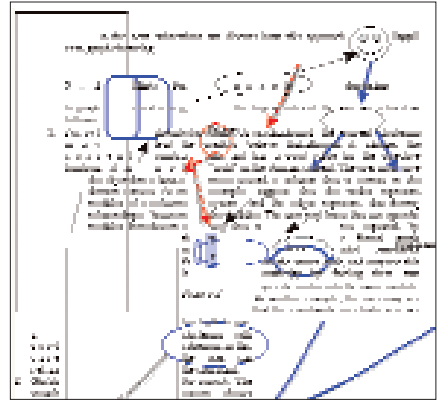


At places, the alignment of images with respect to the text was bad

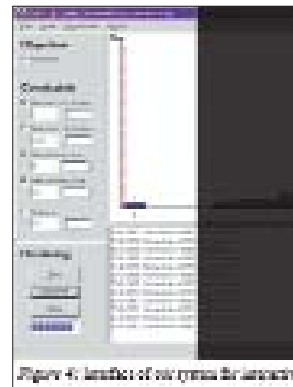


Lotus WordPro was able to perfectly reproduce graphs, including pie-charts, and it had problems with just one bar graph

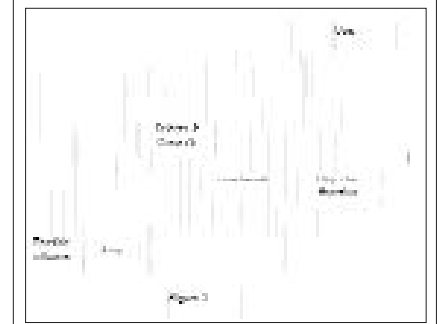
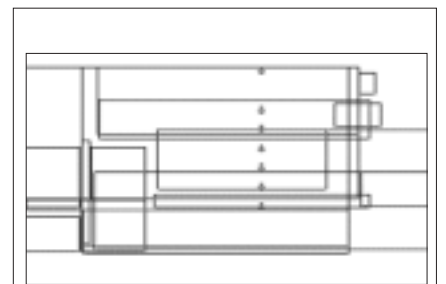
ded screenshots properly, diagrams and images caused problems. It missed out on a lot of them, and among the ones that were displayed, a couple of them were distorted beyond recognition. These were, typically, diagrams with sev-



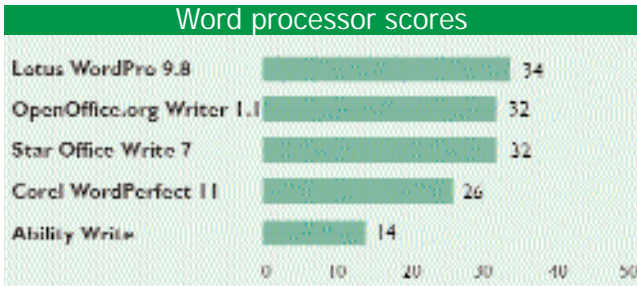
This simple diagram was completely deformed, and displayed over the original text



The callouts were altogether absent, and WordPerfect couldn't even display the embedded screenshot completely



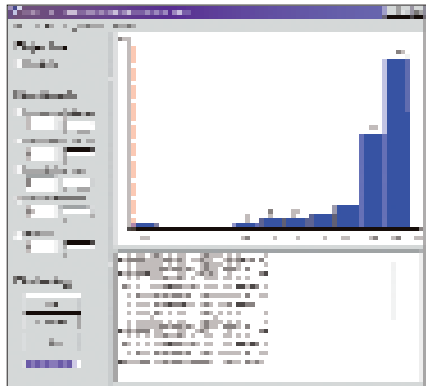
These simple diagrams was deformed beyond recognition



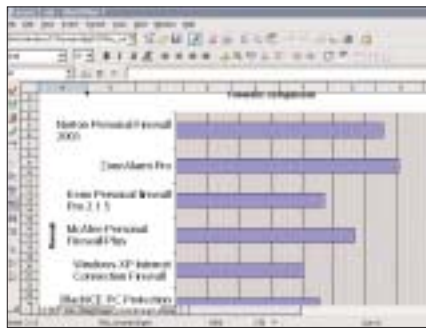
It was also able to display the document with complex functions (hlookup), but as we expected, it failed to show the controls on the worksheet. This was not a glitch in the software; since the controls used were native Windows controls—there was no way it could be used on Linux. Other than this, StarOffice Spreadsheet gave decent compatibility, and handled all the files with multiple worksheets, embedded graphs and referenced formula-

las without major errors. **Corel Quattro Pro 11** Symbol jumble

Of all the tools we tested, Quattro Pro 11 was the best. It could correctly display almost all the graphs, as well as formulas. There are slight changes in the way formulas get written— instead of an '=' symbol at the start of the formulas, Quattro uses the '@' symbol. But it does a very good job at converting existing Excel spreadsheets, and doesn't alter the behaviour of the formulas. In fact, of all our test spreadsheets, just one was unusable. This was the one with the embedded Windows control.



Although the image was properly displayed, the captions were missing



StarOffice Spreadsheet 7 had no problems displaying multiple worksheets and embedded graphs

Ability Spreadsheet Lacking in ability

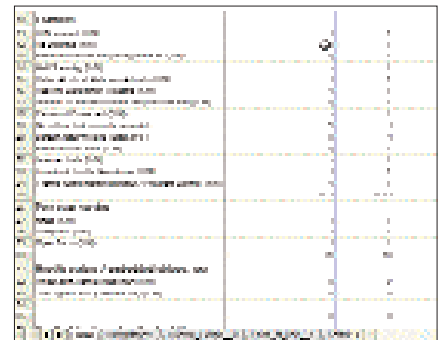
Ability Spreadsheet was the worst of all the spreadsheets; only two test sheets had minor errors, one had major errors and the



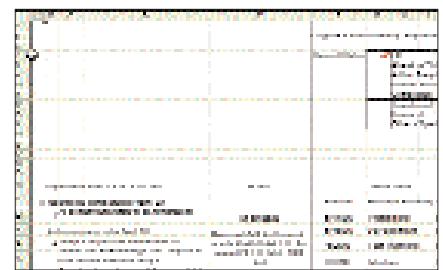
Some of the diagrams simply refused to not come up in WordPro



StarOffice Spreadsheet was one of the few applications that could display the directions in this box exactly as it was in Excel



Formulas that referred to multiple worksheets were displayed, but graphs were absent

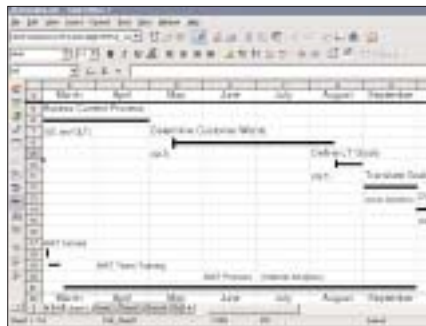


Ability Spreadsheet completely ignored graphs

eral ellipses and circles. **SPREADSHEETS**

StarOffice 7 Spreadsheet Not a friend of Linux

StarOffice 7 Spreadsheet was able to open almost all our Excel files without a glitch.

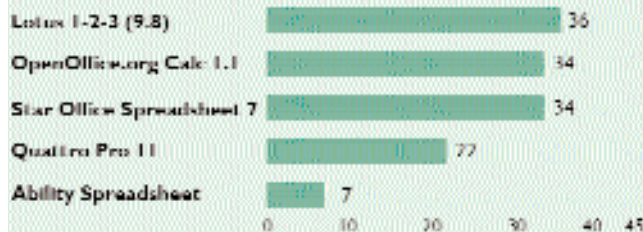


While the timeline in this graph was not as good as it looks when displayed in Excel, it was good enough to work with

	Dirn+Chen	28 / 1000	22.22%	27.70%
Dirn - S1.1	2749320	83.17%	83.17%	
Dirn - S1.2	211300	70.00%	27.00%	
Dirn - S1.3	181900	63.84%	19.14%	
Dirn - S1.4	2211000	70.00%	70.00%	
Dirn - S1.5	271194	87.00%	87.00%	
Dirn - S1.6	18441	1.62%	0.12%	
Dirn - S1.7	2211000	83.17%	83.17%	
Dirn - S1.8	2749400	87.00%	87.00%	
Dirn - S1.9	181900	63.84%	19.14%	
Dirn - C1.0	2749320	83.17%	83.17%	
Dirn - C1.1	211300	70.00%	27.00%	
Dirn - C1.2	181900	63.84%	19.14%	
Dirn - C1.3	2211000	70.00%	70.00%	
Dirn - C1.4	271194	87.00%	87.00%	
Dirn - C1.5	18441	1.62%	0.12%	
Dirn - C1.6	2211000	83.17%	83.17%	
Dirn - C1.7	2749400	87.00%	87.00%	
Dirn - C1.8	181900	63.84%	19.14%	

Ability displayed vertically merged cells perfectly

Spreadsheet scores



rest were completely unusable. While it supported multiple worksheets in a single spreadsheet and understood the formulas without any errors, the graphs in the worksheets did not turn up. It also had minor formatting problems, but displayed

the vertically merged cells perfectly. **Lotus 1-2-3** Formatically challenged

Lotus 1-2-3 has an amazing level of compatibility with Excel files. In the main sheet, all the data, formulas and graphs across multiple worksheets were properly imported. However, the formulas were written in a completely different format. When there were problems with importing, it created and displayed a detailed log file. There were minor formatting errors, though—it didn't display vertically merged cells properly.

rest were completely unusable. While it supported multiple worksheets in a single spreadsheet and understood the formulas without any errors, the graphs in the worksheets did not turn up. It also had minor formatting problems, but displayed

PRESENTATION SOFTWARE

StarOffice Presentation

A star indeed!

StarOffice Presentation was the best tool as compared to the other presentation software. In PowerPoint slides, StarOffice 7 gave better performance than the other software, but had problems displaying some of the custom bullets.

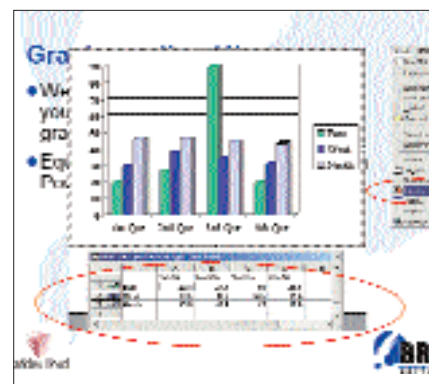
OpenOffice.org Impress

It did impress

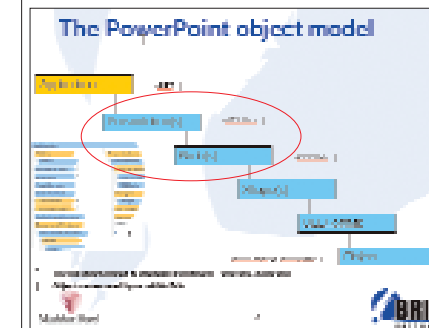
This product was very similar to the StarOffice Presentation tool, and gave similar results. Overall, however, StarOffice is a better product since it came with its own java libraries whereas OpenOffice.org didn't have one. When it came to custom bullets, OpenOffice.org completely ignored them whereas StarOffice

replaced them with simple ones. **WordPerfect Presentations11** Far from being perfect

Presentations 11 had problems with the



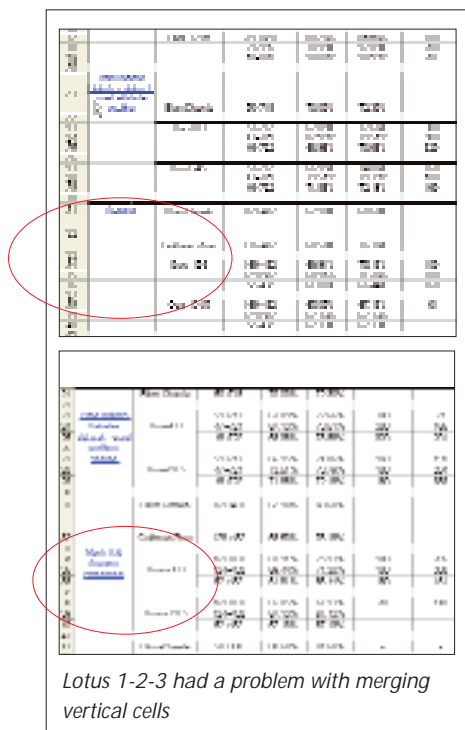
Corel Presentations 11 had a problem displaying background images. At places, it displayed the background image over the foreground text



Some of the slides could not be reproduced perfectly by Presentations



Lotus Freelance Screenshow had no problems displaying complex slides, such as the one here



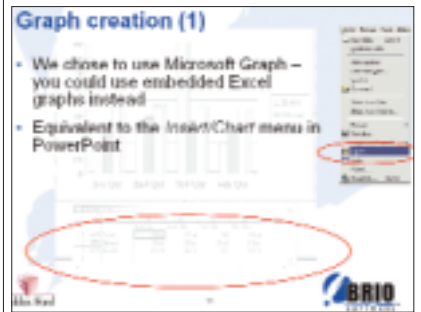
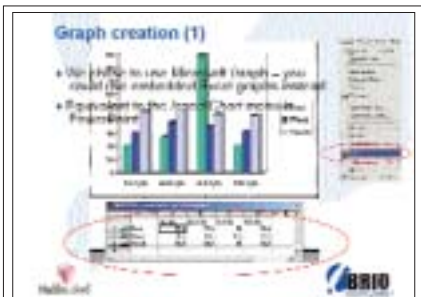
Lotus 1-2-3 had a problem with merging vertical cells

AppleWorks 6

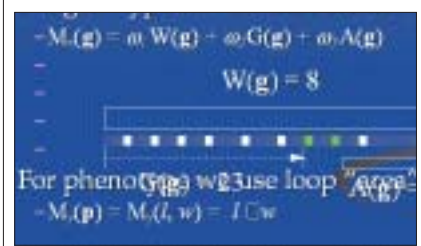
Although it's good at handling its own file formats, and offers excellent rendering of text, images and tables, AppleWorks has problems in the MS Office compatibility department. In our word document tests, AppleWorks wasn't able to display simple colours within the tables in one of the test files; it showed grey shades in place of the actual green and red. Moreover, it couldn't handle the table layout properly. It had problems in the standard text formatting test file too; white text on a black background was not displayed. As far as presentations are

concerned, AppleWorks can't handle PowerPoint files, so there's no question of compatibility.

In Excel, Apple Works couldn't handle more than one worksheet. The formulas that used multiple worksheets got altered when opened in AppleWorks, and the parts of the formulas that referred to other worksheets were removed. The graphs that were linked to the main worksheet, but displayed in other worksheets also weren't displayed. In sum, Apple Works simply is not a product meant for MS Office compatibility.

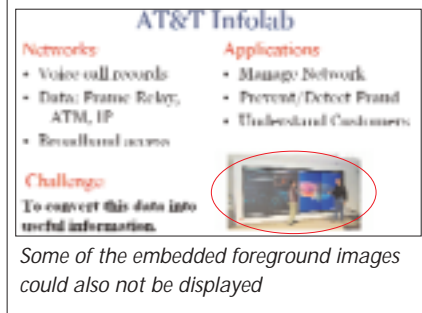


Freelance Screenshow had problems displaying background images



While it generally had no problems with formulas, Freelance Screenshow sometimes just couldn't get the layout right

transitions test file. While the colours were displayed properly, it could not display the contents of the slide. Some of the transitions, too, weren't displayed properly. One of the test files wasn't opened at



all, and Presentations

gave an error message saying the file was corrupt; the same file was opened by the other office suites.

Some documents weren't imperfectly displayed, apparently because the conversion filters required to import the documents were unavailable, but we got the same errors even after complete installation of the software, with all the filters included.

Lotus Freelance Screenshow

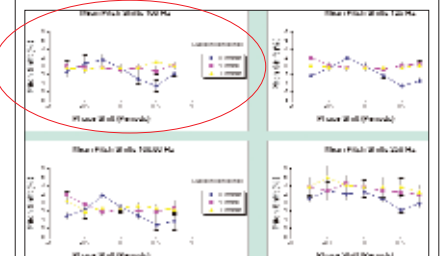
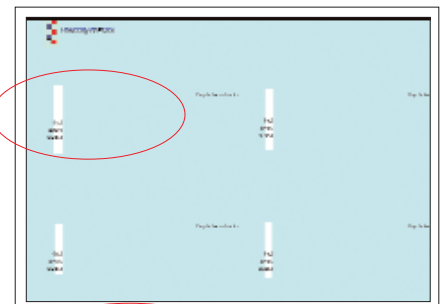
Not a great show!

Freelance ScreenShow had absolutely no problems with graphs, and displayed all of them perfectly. But it could not render transitions and slide effects properly. Some of the mathematical formulas were not displayed in their original form.

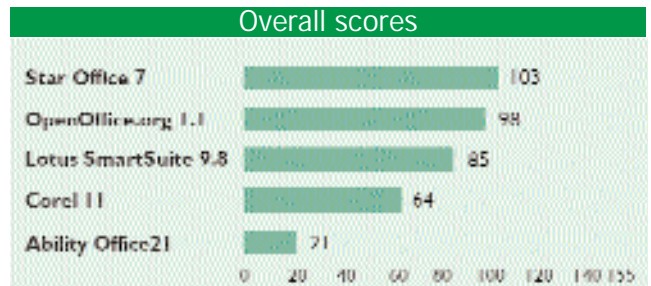
Conclusion

The level of compatibility offered by the alternative suites with MS Office documents varies widely. This even varies to great degrees amongst individual components of suites. These variations proved costly for the suite as a whole.

While Quattro Pro offered good compatibility with Excel files, the other components—WordPerfect and Presentations—



Some of the graphs, too, couldn't be displayed



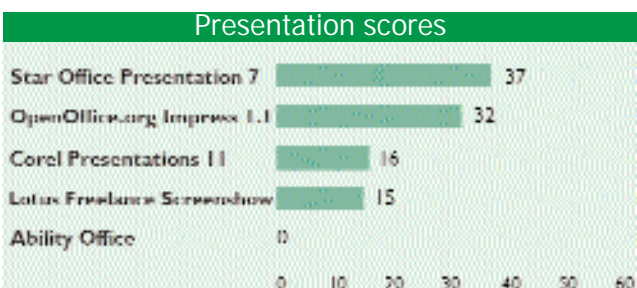
brought the scores down. It managed an overall score of 64, and was fourth best. Ability Office, on the other hand, just didn't seem ready at all to handle our tests, consistently coming in last in all the tests. Ability ended up with a pathetic overall score of 21.

While Lotus SmartSuite 9.8 topped the spreadsheet and word processor tests, it was foiled in the presentation test, coming in last. Lotus SmartSuite finished third overall, with a score of 85.

OpenOffice.org 1.1 and Star Office 7 were the only two real contenders to the title, and as expected, took the top two spots. OpenOffice.org was impressive, and managed to tie with Star Office in the word processor and spreadsheet tests. Star Office made a late dash for the finish in the presentation test, beating OpenOffice.org by 5 points to end up with a decent overall score of 103. Unlike Star Office, OpenOffice.org is completely free, and made a very commendable effort.

In the end, we decided that Star Office 7 was indeed the best suite as a whole, and is the best Microsoft Office replacement out of the lot.

PRAVEEN KURUP





Products that topped our performance tests

CPU

Pentium 4 3.2 GHz
800 MHz FSB
+ Supports 800 MHz FSB and Hyperthreading
- Very expensive
Contact: Nebula Technologies
Phone: 022-26848612
E-mail: pratik@nebulatech.com
Price: Rs 37,000

Motherboard

865PE Neo2
+ Great performance, dual-channel DDR 400
- Expensive
Contact: Cyberstar
Phone: 080-2276986
E-mail: narend@cyberstarin.net
Price: Rs 12,500

Primary Storage

Maxtor 250 GB MaxLine Plus II
+ Tons of space
- Gets heated
Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 19,000

Secondary Storage

Combination Drive
Sony CRX 300A
+ Top performance, vertical mountable, half height, Mt. Rainer support
- No CD-R or CD-RW media
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rpotechindia.com
Price: Rs 5,200

Graphics Card

Gainward GeForce FX 5900 Ultra 256 MB
+ Unmatched performance
- Very expensive
Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 37,875

Display

LCD Monitor
SONY SDM-N80 18.1-inch
+ Stylish, great performance
- External power supply takes up extra space
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rpotechindia.com
Price: Rs 1,47,000

Speakers

Creative MegaWorks THX 5.1 550
+ Mindblowing sound
- No digital inputs
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshkhar_bhatt@ctl.creative.com
Price: Rs 25,999

Input Devices

Microsoft Multimedia Keyboard
+ Great feel
- Expensive
Contact: Microsoft Corporation
Phone: 011-5151 1234
E-mail: connect@microsoft.com
Price: Rs 1,498

Microsoft Wireless IntelliMouse Explorer

+ Optical Mouse, USB interface, two extra buttons
- Expensive
Contact: Microsoft Corporation
Phone: 011-5151 1234
E-mail: connect@microsoft.com
Price: Rs 4,278

Sound Card

Creative SoundBlaster Audigy 2 Platinum
+ 6.1-channel output
- Expensive
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshkhar_bhatt@ctl.creative.com
Price: Rs 15,199

Laptop

IBM T40
+ Great design, excellent performance
- Expensive
Contact: IBM India Ltd
Phone: 080 2063199
E-mail: sanmenon@in.ibm.com
Price: Rs 1,69,990

Brandebc PC

Zenith Premium PC
+ 3.2 GHz, 17-inch LCD
- No Operating System
Contact: Zenith Computers Ltd
Phone: 022-2837 7300
E-mail: one-up@zenith-india.com
Price: Rs 60,000

Multi-functional Device

Xerox WorkCentre Pro 412
+ Fast printing, excellent quality
- Expensive
Contact: Xerox Modicorp Limited
Phone: 0124-2561930/ 940
E-mail: kuldeep.malhotra@ind.xerox.com
Price: Rs 73,500

Laser Printer

Samsung ML-1710
+ Extremely fast
- Does not support USB 2.0
Contact: Samsung Electronics India information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@samsungindia.com
Price: Rs 16,000

Inkjet Printer

Canon S530D
+ Supports direct printing from

digital cameras
- Expensive
Contact: Canon India Ltd
Phone: 011-26806572
E-mail: rajeev.singh@canon.co.in
Price: Rs 24,995

Scanner

HP Scanjet 4570C
+ Excellent scan quality
- Heavy and bulky
Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 17,999

PDA

Sony CLIE PEG-TG50
+ Runs Palm OSS and has a 320 x 320 TFT LCD display
- Rapid battery consumption
Contact: Solar Systems
Phone: 022-56916834
E-mail: solarsystems@vsnl.net
Price: Rs 25,500

Mobile Phone

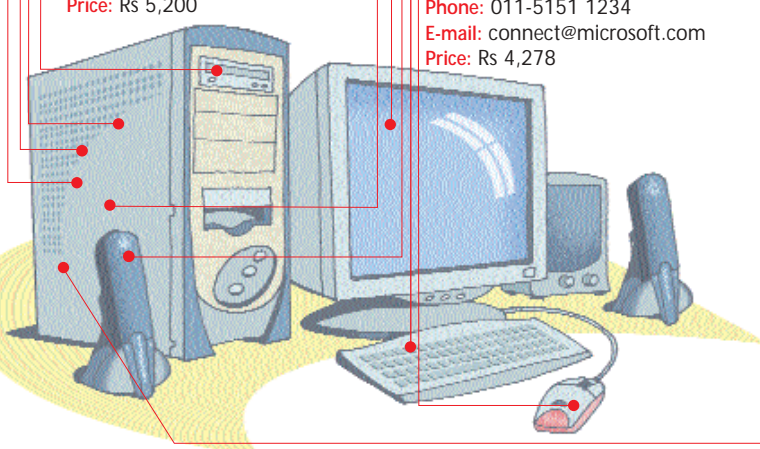
Sony Ericsson P800
+ Easy and intuitive navigation
- Blocky design makes it bulky
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 35,400

Digital Camera

Canon IXUS 400
+ Cerabrite body, better buttons layout, wide shutter speed range
- Ultra compact body hampers handling
Contact: Canon India Pvt Ltd
Phone: 011-2680 6572
E-mail: Shyam@canon.co.in
Price: Rs 49,995

MP3 Player

Apple iPod
+ Hard-drive based, FireWire cable bundled, line-out socket
- Very expensive
Contact: Apple Computer International Private Limited
Phone: 080-555 0575
E-mail: indiainfo@asia.apple.com
Price: 30 GB-Rs 45,000, 15 GB-Rs 36,000, 10 GB-Rs 28,000





Products that are the best value buy

CPU

AMD Athlon XP 1800+

- + Sufficient power for normal desktop use
 - Difficult to install the heat sink
- Contact:** AMD Far East India Ltd
Phone: 011-26238620
E-mail: amd@surfgold.com
Price: Rs 3,200

Motherboard

ASUS A7S266

- + Supports DDR and SD, onboard video, onboard sound, onboard graphics, USB 2.0
 - Not appropriate for gamers
- Contact:** Neoteric Infomatique
Phone: 022-24172600
E-mail: sales@neoteric-info.com
Price: Rs 3,500



Primary Storage

Samsung SV1203N 120 GB

- + Noise Guard and ImpacGuard
 - 5400-rpm drive
- Contact:** Samsung Electronics India Information Telecommunication India Pvt. Ltd
Phone: 011-515111234
E-mail: marketing@samsungindia.com
Price: Rs 6,900



Secondary Storage CD-Writer

Benq CRW5224W

- + Cheap
 - Data cable not bundled
- Contact:** BenQ India Pvt Ltd
Phone: 022-25705231
E-mail: salesenquiryin@benq.com
Price: Rs 2,800



Graphics Card

Compro Paladyne FX 5600 128 MB

- + DirectX 9.0 compatible
 - Very expensive
- Contact:** Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 11,275

Speakers

Adcom ACSPSW-660 2.1

- + Two satellite speakers and one mini sub-woofer, good gaming performance
 - Maximum volume causes distortion
- Contact:** SABS
Phone: 022-23808564
E-mail: sabs@vsnl.net
Price: Rs 550

Display

CRT Monitor

LG StudioWorks 700S

- + High resolutions, great performance, anti-static, anti-glare, anti-reflection surface treatment
 - No extra accessories
- Contact:** LG Electronics India Pvt Ltd
Phone: 0120-2560900
E-mail: response@lgezbuy.com
Price: Rs 7,500

Input Devices

Samsung PC Keyboard

- + Unmatched value for money
 - No multimedia buttons, wrist support not bundled
- Contact:** Samsung Asia Pvt Ltd
Phone: 022-22814886
E-mail: marketing@samsungindia.com
Price: Rs 300

Logitech Scroll Mouse

- + Ambidexterous design
- Contact:** Rashi Peripherals
Phone: 022-28260258/ 59
E-mail: ho@rptechindia.com
Price: Rs 475

Branded PC

HCL EzeeBee

- + Winner of Best Value and Best Performance
 - Needs a better graphic card
- Contact:** HCL Infosystems Ltd
Phone: 0120-2520977
E-mail: raman@hclinsys.com
Price: Rs 27,490

Laptop

ACI Ethos 4

- + Good configuration for the price
 - Hampered ergonomics
- Contact:** Allied Computer International (Asia) Pvt Ltd
Phone: 022-56943260/ 26733124/ 56407000
E-mail: sales@aci-asia.com
Price: Rs 54,000

Multi-function Devices

HP PSC 2110

- + Good print quality
 - No fax capabilities
- Contact:** HP India Ltd
Phone: 011-26826000
E-mail: seema.dawar@hp.com
Price: Rs 9,999

Laser Printer

Samsung ML-1510

- + Good image quality
 - Slow print speed for combo document
- Contact:** Samsung Electronics India Information and Telecommunication Ltd
Phone: 011-515111234
E-mail: farrukh@samsungindia.com
Price: Rs 9,999

Inkjet Printer

HP 3325 Deskjet

- + Very small form factor
 - 765 KB of buffer memory
- Contact:** HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 2,999

Scanner

HP 2300 Scanjet

- + Low warm-up time
- Contact:** HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 3,499

PDA

Palm Zire 71

- + Affordable, good battery life, comprehensive PIM applications
 - No Palm Universal Connector, no backlight, no expansion slots
- Contact:** Tech Pacific Technology (India) Limited
Phone: 022-55960101
E-mail: aparna@corvoshandwick.co.in
Price: Rs 7,500

Digital Camera

Kodak DX6340

- + 3.1 megapixel camera with 4X optical zoom
 - Only 16 MB memory
- Contact:** Neoteric Infomatique
Phone: 022-24172600
E-mail: rajeev@neoteric-info.com
Price: Rs 23,900

Mobile Phone

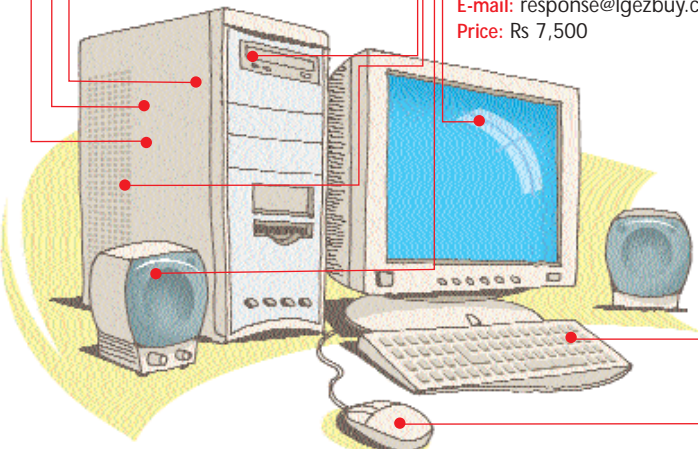
Sony Ericsson T200

- + Light-weight, perfect grip, WAP 1.2.1 browser and 43.2 Kbps GPRS, PIM features
 - Keys are hard and noisy, unusual socket for the charger
- Contact:** Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 6,495

MP3 Player

Ennyah Digisound II DS601

- + Fast data transfer, feature-rich
- Contact:** Great World Tech Pvt Ltd
Phone: 022-23892828
E-mail: sales@gtechworld.com
Price: Rs 6,500 (approx)



Bazaar

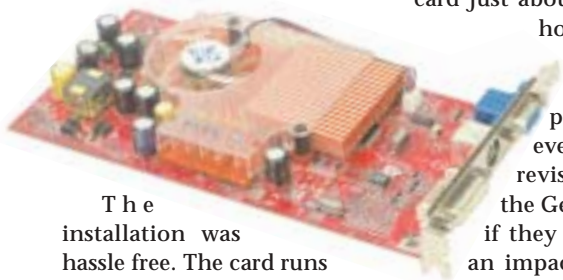


We test the latest and the best hardware and software products available in the market

MSI GeForce FX 5600 128MB

Authoritative performance

The FX5600-VTDR128 is based on nVidia's FX5600 chipset. As usual, MSI's offering is packed to the gills with free games, remote control, VIVO connectors, composite and S-video cables, etc. To top it all, you also get two software discs—Restore-It and WinDVD.

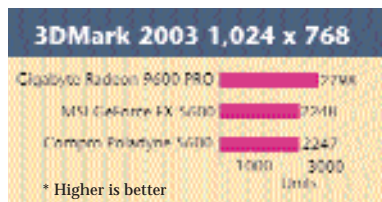


The installation was hassle free. The card runs at a core clock speed of 325 MHz, while the memory clock speed is 275 MHz with a memory bandwidth of 8.8 GBps. This card supports DirectX 9, so you can happily play all the up and coming games, with all the eye-candy turned on too.

We ran the usual assortment of tests on this card, and boy did this card run them. If you want to play all your favourite games at high resolutions, this card will definitely not disappoint you. Though our performance winner in the last comparison—the Gigabyte 9600 PRO—remained the top scor-

er in all the tests, the MSI did give it some close competition. The Gigabyte soared in the 3DMark 2003 tests with a score of 2798, while the MSI scored only 2248, but the MSI maintained a lead of about 29 fps in the *Serious Sam* and *Quake III Arena* tests.

Overall, the Gigabyte card just about managed to hold on to its crown, as the MSI is a great product. However, they need to revise the price of the GeForce FX 5600 if they want to make an impact. We suggest you wait a bit till the price drops before snatching up this beauty.



SPECIFICATIONS

GeForce FX 5600 chip;
325 MHz core clock speed;
275 MHz memory clock;
1.3 billion texels/sec fill-rate;
DX9/OpenGL 1.4 compliant

MSI GeForce FX 5600 128MB B+	
Performance	▶▶▶▶▶
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶

Price: Rs 13,000
Contact: Cyberstar Infocom Ltd
Phone: 080-2276986/ 226781
E-mail: narend@cyberstarin.net
Web site: www.msi.com.tw

Monarch MV-20

Precious moments on DVD

The MV-20 is an affordable and versatile video capture card. It offers support for capturing videos directly to DVDs. It has both S-video in and out connectors, and also Composite in and out connectors. Stereo mini jacks are provided for audio line-in and line-out. With such an assortment of connectors, you can do professional-level video editing with ease.

The card can take video input from the either a VCR or your DV camera, and transfer the video to your computer. You can then save it in a format of your choice. The options provided are quite a few, including MPEG-1, MPEG-2 and DVD PAL. After you capture the video, you can edit it using the bundled Ulead VideoStudio software. The software offers numerous effects and transitions that you can apply with ease. You can also edit the audio to make it more professional. The application interface is pretty straightforward.

You can also take snapshots of your videos, which you can use to make jewel cases, or view as a slideshow. This is especially useful for

video professionals who make marriage and other family function videos. To put all this on to a DVD, Monarch uses



the Ulead DVD MovieFactory software. The application pops up when you click the Make DVD/VCD button, and all you need to do is follow the instructions.

With this card, you can also connect your VCR or DV Camera to a computer, and watch the output on TV while the card does its job. Such functionalities will definitely be appreciated by users and professionals alike, especially at its reasonable price.

SPECIFICATIONS

Output formats: DVD, VCD and SVCD, onboard brightness, contrast, hue and saturation controls, 2 RCA jacks for Composite, 2 for S-video, 2 3.5 mm stereo audio jacks.

Monarch MV-20 B+	
Performance	▶▶▶▶▶
Features	▶▶▶▶▶
Ease of use	▶▶▶▶▶
Value for money	▶▶▶▶▶

Price: Rs 14,800
Contact: Monarch Video Vision
Phone: 022-2261 9022
Fax: 022-2261 8706
Email: viren@bom2.vsnl.net.in
Website: www.monarchvision.com

Sony Ericsson T610

Talk in style!

If you want to make a fashion statement, this little beauty is for you. The crystal-clear 16-bit display ensures perfect readability, which, however, is slightly affected by the sun. A tiny mirror on the back panel allows you to take your own picture. A big plus is that even at the weakest signal strength, voice is astoundingly clear.

The address book allows you to store 510 contacts with 8 entries each. The phone allows you to store a little over 2 MB of data, if you remove the pre-defined set of items. You might think this is too little, but it should be enough, for several reasons. There are a couple of bundled games; there's a service that lets you upload your images to the Sony Ericsson server, which



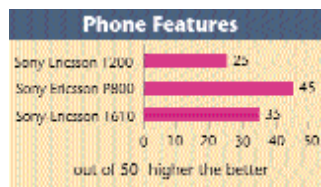
you want to send a message, you have to manually hunt down each contact you want to send your message to.

The MMS editor in this phone is better implemented than in most. It also allows you to block advertisements and messages from anonymous users.

There's a DJ mixer, using which you can create your own tunes. The pre-defined tunes are nice, and moreover, since the phone supports 32-bit or 'true tones', the sound is refreshingly clear. The battery will last 3 days with normal usage, and upto 5 days with minimal usage.

The T610 is not perfect, though. Newer phones allow you to view SIM and phone data simultaneously; this phone doesn't. The image quality of the camera is no great shakes; the resolution is only 255 x 388. Another thing that's missing is a program to back up your SMSes, WAP profiles, etc.

But all in all, if you're planning to buy a colour phone with loads of features at a reasonable price, you need look no further.



allow you to free up space; and there's a static memory for the phone and SMS and voice tags.

Text messages can be printed via a Bluetooth connection, and also saved to the SIM. Support for long messages is also provided, so you aren't stuck to the 160-character limit. However, the 'Send To Many' function is missing, which means that if

Price: Rs 19,995
Contact: Sony Ericsson India
Phone: 011-2618 0808
Fax: 011-2618 7878
Email: dhiraj.soni@sonyericsson.com

SPECIFICATIONS

16-bit display, 2 MB memory, 95 grams, Tri-band, GPRS and HSCSD, 32-bit polyphonic sound, support for Java and Mophun games

Sony Ericsson T610		A-
Performance	▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶	
Ease of use	▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶	

1/2 p V AD

Epson Stylus C63

Smart impressions

This printer stands out from the rest of the crowd: try this little test. Take a printout from any inkjet printer and immediately pour water on it. Does the printout stay the same? It wouldn't. But it does with this printer. We actually tried it!

The printer has a small footprint, and will fit snugly on your desk. The interface is USB, but you also have the parallel port option. The paper feed tray is top-loading. There are three buttons on the top—one for the power, one for changing the ink cartridge, and one for cancelling a print.

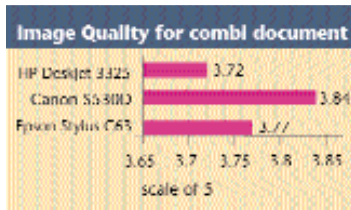
The text printout was quite good; however, at lower font sizes, the dithering is pretty obvious. The photo quality was average; the overall image was dark, but contrast reproduction was very good. In the text with image printout, the results were quite good, indicating that this printer was built primarily to serve as a text

Price: Rs 4,000
Contact: Epson India Ltd
Phone: 022-2826 1515
Fax: 022-2825 7287
E-mail: berth@eid.epson.co.in
Web site: www.epson.co.in



printer, with a sprinkling of images.

The Epson Stylus C63 retails for a competitive Rs 3,999. Going by the price-to-performance ratio, you can't go wrong with it.



SPECIFICATIONS

232 KB buffer RAM, 17 ppm, USB and parallel interface, paper types supported: A4 and letter sizes and special paper

Epson Stylus C63	
Performance	★★★★★
Features	★★★★★
Build quality	★★★★★
Value for money	★★★★★

HP LaserJet 1015

Hardly jet-set

The HP LaserJet 1015 is easily one of the most compact and lightweight laser printers available, tipping the scales at just 5.9 Kg. The printer body is dark blue in the front and silver-grey on the sides. The output paper



tray can't hold more than 25 sheets at a time. The input tray can hold up to 150 sheets, and 10 sheets can be lined up for manual feed.

The 1015 has 16 MB of non-upgradeable buffer memory. The user interface consists of a simple two-button combination, along with

three LEDs, to indicate the printer's operational status, as well as errors. The 1015 can connect to a PC through both the USB and parallel port interfaces—the cables aren't bundled.

Despite the 16 MB buffer, the 1015's performance was mediocre, especially while printing complex documents. The combo PDF document was printed in 19.2 seconds, but the quality of the printout was average. It scored even worse in the image test, with prominent banding seen throughout the printed photo. The printer did perform much better in the MS Word print tests, with

Price: Rs 14,499
Contact: Hewlett Packard India Ltd
Phone: 0124-256 6111
Fax: 0124-256 6112
Email: seema.dawar@hp.com
Website: www.hp.com

excellent quality and at good speeds.

The 1015 is targeted primarily at home and SoHo users. But, with its poor performance in printing complex documents, it can only be suitable for users with simple printing requirements. Even though the 1015 looks good on paper, the Rs 14,499 price tag is entirely unjustified.

SPECIFICATIONS

133 MHz RISC processor, 16 MB buffer, 14 ppm, USB 1.1/IEEE 1284, PCL 5/e and host-based drivers, media supported: A4, envelopes, transparencies, postcards

HP LaserJet 1015	
Performance	★★★★★
Features	★★★★★
Build quality	★★★★★
Value for money	★★★★★

Logitech Cordless Click Plus

Just point and click

The Click Plus mouse is ergonomically shaped, albeit only for the right-handed. Its contours are slightly curved at the top, making it a little uncomfortable for people with small hands. The mouse looks good, with a blue and silver body, instead of the staid white or beige. The buttons themselves are very well calibrated, and respond very well too. Besides the standard right and left buttons and the mouse wheel, the mouse also features a tiny extra button just beneath the mouse wheel, and two thumb buttons on the sides—putting six buttons within easy reach. It can be operated up to 5 to 6 feet away from the receiver.

The Click Plus mouse performs very well, and is very precise in both movement and selection of objects

on the monitor. The scroll wheel's movement is slightly jerky, but definitely smoother than earlier Logitech mice.

The mouse is good for use with applications such as Photoshop and Microsoft Word, but

in our gaming test, it was a different story altogether. The mouse was oversensitive, with the crosshair all over the place; this isn't really a mouse meant for a gamer. Surprisingly, when we tested the mouse with newer games

SPECIFICATIONS

RF, optical sensing technology, PS/2 or USB interface for RF receiver, three extra customizable buttons, ergonomic design for right-handers, two AA batteries included.



such as *Halo*, it gave much better results.

The Click Plus cordless is a great product, with its cool looks and impressive features. But considering the mixed

results in the gaming tests, usability may be restricted to mainstream office applications, and applications such as image editing software.

Price: Rs 4,300
Contact: Logitech Far East Ltd.
Phone: 022-2490 5149
Fax: 022-2490 4145
Email: response@logitech.com
Website: www.logitech.com

Logitech Cordless Click Plus		B
Performance	▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶	
Ergonomics	▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶	

Ulead Photoimpact XL

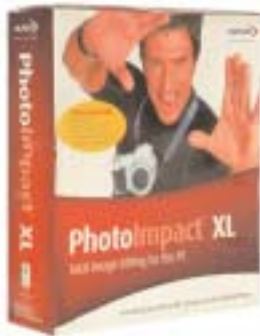
XLent Impact

Ulead Photoimpact XL offers a little bit of everything—from full-fledged image editing to designing Web-page effects, to improving photos taken by digital

cameras. The software has a very handy and one-step tool, called Express-Fix, which can analyse photographs and automatically display the correct options for retouching and restoring them, all within a few seconds. Images can be imported from a wide range of media, such as digital cameras, scanners, or straight off the Net.

Special effects and filters can be simply dragged and dropped on to a palette manager, which also allows for a quick preview of the selected filter. Photoimpact also boasts of some very useful, creative effects such as lightning and meteor showers, which can be animated effortlessly.

With all its features, Photoimpact XL does have some serious limitations. The main disadvantage is its inability



to work with the CMYK image format. On opening a CMYK file, the software immediately converts the image into 48-bit RGB, which is very inconvenient for pro-

fessionals involved with heavy-duty editing. Also, the interface could do with some tweaking.

Ultimately, although Photoimpact XL can do with a little improvement, its huge repertoire of tools, along with its uncomplicated and savvy design, make it stand out from the crowd of mid-level image editors. Considering the high price of the recently released Adobe Photoshop Creative Suite, Photoimpact XL, with its comparatively low price is a good purchase choice.

SPECIFICATIONS

Microsoft Windows XP, 98SE, NT 4.0 SP6, 2000, ME, Intel Pentium II or better, 64 MB RAM (256 MB recommended), 450 MB hard drive space

Price: \$89.95 (approx. Rs 4,100)
Contact: Micrographics
Phone: 9886082075
Fax: 011-2201590
E-mail: micrographics@vsnl.com
Web-site: www.asiapac.ulead.com

MSI 865PE Neo2		B+
Performance	▶▶▶▶▶▶▶▶	
Features	▶▶▶▶▶▶▶▶	
Ease of use	▶▶▶▶▶▶▶▶	
Value for money	▶▶▶▶▶▶▶▶	

1/2 p V AD

BenQ M550G

Only a budgeteer's option

The BenQ M550G GSM dual-band sports a champagne-coloured front fascia, with a black rear panel. Chrome strips on the sides make it look sleek, but compromise on grip. The build quality is bad—it squeaks when you press it hard.

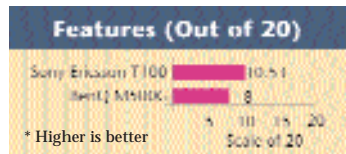


One feature that sets it apart is the inverted black LCD display—white text on a black background, with a choice of a blue, purple, or orange backlight. Though the purple looked gaudy, it was still the best backlight for the phone.

The buttons are placed tightly, making this phone a message junkies nightmare. The four-way navigation button is sure to give you dead-clicks. You can assign different icons for home, office, fax, etc., for your phonebook entries. The

phone comes with a charger, hands-free headset and a CD.

The M550G has voice clarity comparable to a Sony Ericsson T100. We couldn't check Internet connectivity, as there was no data cable provided. At Rs 5,750, the M550G is quite cheap for a phone that has GPRS and a bundled headset, but it loses on aesthetics and build-quality. Only if you're on a shoe string budget, and want a GPRS enabled phone, should you consider this an option.



SPECIFICATIONS

Dual-band; WAP 1.2.1; GPRS; 500 phone book memory; 79 gms; inverted black LCD; hands-free kit

BenQ M550G	
Performance	▶▶▶▶▶
Features	▶▶▶▶▶
Build Quality	▶▶▶▶▶
Value for money	▶▶▶▶▶

Price: Rs 5,750
Contact: BenQ India Pvt Ltd
Phone: 022-25705230
E-mail: salesenquiryin@benq.com
Web site: www.benq.com

Tech Com Keyboard

Keep off!

This keyboard is a vanilla keyboard with some extra multimedia keys thrown around for an upmarket feel. The keyboard sports a silver body, studded with black keys with white inscriptions. The first thing you notice is the extra buttons along the top edge, which allow you to control



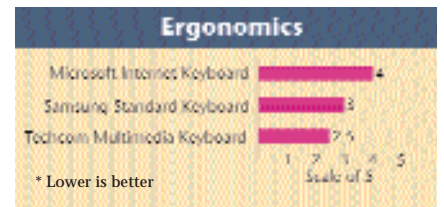
various features. They allow you to open the calculator, My Computer, increase or decrease the volume, open Media Player and play your favourite movies, or even open your e-mail client or browser. There is a 'Sleep' button to instantly put your computer into standby mode. The installation process is easy, with no issues at all, and the software is easy to configure.

On the ergonomics front, the keyboard isn't really spec-

tacular. The quality of keys in terms of tactile feel is very important, and though the keys afford touch typing, they are a bit tacky, and tend to get stuck with fast typing. Similarly, the multimedia buttons are of thick rubber, and using them is definitely not comfortable. They also totally lack finesse.

Priced at Rs 425, the keyboard is not expensive for the features that are on offer, but

Price: Rs 425
Contact: Shree Sagarmatha Distributors Pvt Ltd
Phone: 011-26428541
Fax: 011-26428540
E-mail: sagarmatha_dlh@bol.net.in



it fails where it matters the most. Despite its low price tag, we don't recommend it.

SPECIFICATIONS

PS/2 interface; 14 extra multimedia keys; three application buttons

Tech Com Keyboard	
Ergonomics	▶▶▶▶▶
Features	▶▶▶▶▶
Build quality	▶▶▶▶▶
Value for money	▶▶▶▶▶

HandsPrint A6 Pocket Printer

A handy printer

The HandsPrint A6 pocket printer targeted at laptop and PDA users. It's light and comes with a velvet carry bag.

The A6 Pocket Printer is based on thermal printing technology, and prints on A6 sized papers at a maximum resolution of 400 dpi. However, you always need to use thermal paper to print. Connectivity to laptops and PDAs is provided through the serial port and infra-red. It requires four AA batteries for standalone printing, and also comes with a 230 V AC adaptor.

We printed a regular Word document from a PC, and it gave fairly good results. The smallest fonts were legible, and there weren't any smudges, but the print speed was somewhat slow. We then tested it on PDAs from different manufacturers. On PDAs



with the Palm OS, even after installing the proper drivers, the Pocket Printer refused to print, for no apparent reason.

This product has a price tag of Rs 5,000, a bit too high for the functionality it provides. It's unique in that it's portable, and it does its job perfectly well. It would be a wonderful companion for PDA users, once compatibility issues are smoothed out.

SPECIFICATIONS

Thermal printing technology, 400 dpi maximum resolution, A6 format printing, four AA batteries in standalone mode, A/C adaptor provided

Price: Rs 4,999
Contact: Pushpam Infotech Corporation
Phone: 9520-4215162
Fax: 9520-4211279
E-mail: sachin@pushpam.com
Web site: www.pushpam.com

HandsPrint A6 Pocket Printer	
Performance	▶▶▶▶▶
Features	▶▶▶▶▶
Build Quality	▶▶▶▶▶
Value for money	▶▶▶▶▶

AIST Movie DVSuite 4.0

Inexpensive, but complex

Movie DVSuite 4.0 is part of the MovieX family of video-editing tools. It comes with a complete video editing suite, a PCI DV capture card with four FireWire ports and a FireWire cable. There is also some third party software—Sonic MyDVD, which lets you create DVDs; and a 30-day trial of Movie3D.

Installation was a breeze. The main workspace has many sub-components, the most important of these being the Timeline, browser window, work window, the effect box and the preview window.

The timeline has four video and two audio tracks, and make the task of inserting and editing frames very simple. Apart from this, Movie DVSuite also has a storyboard mode that makes importing

clips and inserting transitions a snap.

While the software packs a punch as far as features are concerned, it does take a beating on the usability front. The interface is complex, and the user has to spend time getting used to it. This aside, it does provide some detailed video editing features.

Professional video editors can consider this product as a cheaper option, but they will find Adobe Premiere or Ulead MediaStudio more feature-rich and useful.

SYSTEM REQUIREMENTS

Intel Pentium II 400 MHz or higher; Windows 98SE, 2000, ME, 2000; also, Windows NT 4.0 with SP 6 if FireWire not used, 64 MB RAM, 8 GB hard disk space for video production; display card with OpenGL support; SoundBlaster compatible sound card

Price: Rs 3,500
Contact: Access Online Pvt. Ltd.
Phone: 022-23840809
Fax: 022-23840789
E-mail: cshah@bom8.vsnl.net.in
Web site: www.aist.com

AIST Movie DVSuite 4.0	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Ease of Use	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

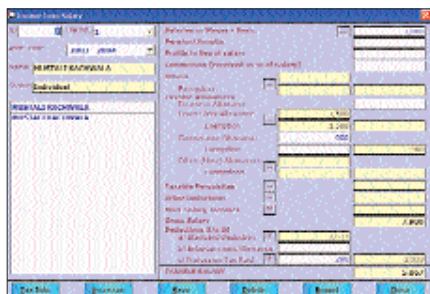
CompTax

Computing Income Tax Made Easy

CompTax is targeted at small to medium accounting firms. Two useful features are calculation of advance and self-assessment

taxes, and calculation of interest payable U/s 234A, 234B and 234C. It also enables reverse tax calculation, thereby helping the user prepare a tax plan.

The software needs specific technical inputs at quite a few locations throughout the package. Apart from these, it is simple to use. The interface is very simple. One aspect that's lacking



is that it does not allow you to modify the Standard Deductions Details, thus entangling you to update the package each year as the laws change.

It is priced at Rs 3,250, which in itself is a good price; but if you need to update each year and pay a Rs 1,500, it's not a good option. The company provides no free updates; at the same time, it doesn't provide any services free of cost. You need to pay service charges, travel charges

Price: Rs 3,250 (Upgrade Cost Rs 1,500)

Contact: Relyon Softech Ltd

Phone: 080-3354600

E-mail: emo@relyonsoft.com

Web site: www.relyonsoft.com

and daily allowances.

The final question that needs to be asked is, after you buy this product, can you save more money in tax than the price of the software, or the cost of the update every year?

SYSTEM REQUIREMENTS

Hardware: Pentium 100 MHz or higher; 32 MB RAM; 50 MB free hard disk space

Software: Microsoft Windows 95, 98, Me, NT, 2000, XP; Internet Explorer 5 or Later; Office 97 or Later

CompTax	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Ease of Use	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

Kodak LS633 Digital Camera

Light on battery, great on performance

Kodak is the first digital camera manufacturer to integrate an Organic LED display into a camera. OLEDs save a lot of power, as they don't need to be backlit.

The LS633 is a 3.11 mega-pixel camera with 3x optical zoom. The camera has 5 pre-defined modes, so you can take pictures with ease. It also has a manual override facility for prolonged exposure. The icon-based menu is intuitive; and browsing is straight forward with the joystick.

The camera returned decent images, and didn't produce dark pictures with the Auto setting—which most cameras struggle to do. Colours were reproduced precisely, and it picked up the details very clearly, making it good choice for those who are into product photography.

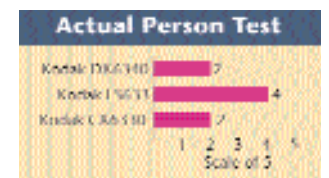
Its 37-111 Schneider-Kreuznach Variogon optical zoom lens did well in our

Price: Rs 29,900
Contact: Neoteric Informatique
Phone: 022-2417 2600
E-mail: rajeev@neoteric-info.com
Web site: www.kodak.com



Zoom test. The image was a little grainy because of the 3.3x digital zoom, but this happens with more expensive cameras as well.

The LS633 is a good buy, and at a cost of Rs 29,900 with the bundled Li-Ion rechargeable batteries, has low running costs too.



SPECIFICATIONS

3.1 mega-pixel, 3x optical zoom, 3.3x digital zoom, OLED display and Li-Ion battery

Kodak LS633 Digital Camera	
Performance	▶▶▶▶▶▶▶▶▶▶
Features	▶▶▶▶▶▶▶▶▶▶
Build quality	▶▶▶▶▶▶▶▶▶▶
Value for money	▶▶▶▶▶▶▶▶▶▶

A Case of Cabinets

Agent 001 jumps into the world of cabinets

It all started out as a great morning. The day looked promising. I'd just taken a sip of my morning coffee, when my secret-agent communication device sounded an SOS. Answering the device, which is cleverly designed to look like a cell phone, I learned that a friend's antique Celeron processor had just died. He was inviting me to the funeral, which involved a little newspaper wrapping and a quick burial in the local dustbin, and then a desperate trip to find a better replacement. He had decided on an Intel motherboard and a Pentium 4 CPU, but had no clue about what cabinet to buy.

Not one to miss out on a tech-shopping spree, I met him at the now infamous Lamington Road, in south Mumbai. A quick scan of my super-secret black book told me that I was close to a dealer I had bought from earlier. He didn't remember me though, but was polite enough to lie, "*Kaise hain aap?* Haven't seen you for a long time". My friend quickly detailed his requirements—something large and airy that would hold all of his 7,65,23,476 peripherals. Off went the vendor, and disappeared into a secret crevice that only he knew existed—the shop could hold three, four if you wanted to be better acquainted with someone. He returned, carrying a rather ordinary looking beige and blue Frontech mini-tower cabinet. Priced at Rs 1,250, it had a 300W power supply, which he claimed was "Full 300W. *Substandard nahi hai!*", and also came with a 1 year warranty. It

had vents for fans, but we weren't convinced. After another quick disappearing act, he came back with an Intex cabinet that cost Rs 1,300. It had adequate drive bays, a 300W SMPS and a year's warranty. Though it had everything that you'd need such as air vents and fans, many colours to choose from and a spacious interior, we weren't convinced just yet. We bid him farewell and moved on to find a little more variety.

The next shop we walked into had a better feel to it. It was spacious, had a look of professionalism and had a well dressed vendor behind the counter. As soon as we mentioned cabinets, he asked what CPU and motherboard combination we had. "If you are buying a Pentium 4 it's fine, but if you have an Athlon, you have to be very careful," he warned us. "Athlons heat up a lot more than Pentiums. If you have other high-end equipment such as a GeForce graphics card, it's going to be hot in there and you'll need additional fans". He showed us a Mercury Oscar cabinet for Rs 1,400. It came with a one year warranty, many cooling vents at the back and a 300W SMPS. When we asked to see something better, he

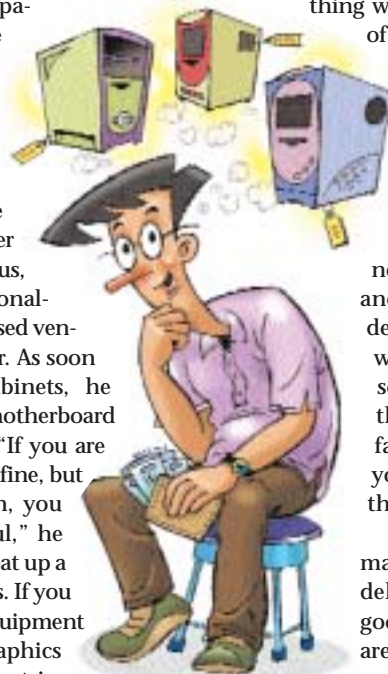
showed us an iBox and an unheard of VIP brand of cabinets that cost Rs 1,500 each. The VIP looked really good, and he said it was a local brand, but had a rock-steady power supply—good for over-clocking. The VIP had easy-to-remove sliding panels and air vents by the dozen. It had everything we needed, but the unheard of branding sent us shop-hopping down the road.

The next store looked swanky as well, but the dealer started pulling out all these unheard of brands with ugly tacky-looking cabinets. They had lights galore, and looked like they were designed by the same person who decorates the insides of some of taxis. He could see the look of disdain on our faces, and asked, "Would you prefer to see the top of the line models?"

What he pulled out then made us almost squeal with delight. There are cabinets, good cabinets and then there are Antec cabinets. He pulled out a jaw-dropping model with thumb screws, remov-

able 3.5-inch bays and screwless locking for 5.25-inch devices—you can install just about anything without ever using a screwdriver. It had vents galore, a 350W SMPS and a blowhole. Now here's a real solution to ventilation. Instead of normal vents, blowholes on the top of the cabinet blow air out from just above the CPU fan. However, it cost Rs 6,500 and he wouldn't accept my undying gratitude—cash and credit cards only please.

An hour later, when I finally ran out of arguments and conceded that my friend could not sell his mother's jewellery, we decided that something a lot cheaper was best. We were left with two options: either a Mercury or VIP cabinet. Though I was more impressed with the features of VIP, my friend preferred to spend his money of a better known brand. The Mercury it was. I went back home dreaming of owning the best Antec there is. ■



ILLUSTRATOR: Mahesh Benkar



■ Insist on cases with adequate ventilation, with fixtures to help you mount fans. Look for rear and front vents.

■ Get extra fans mounted on the case, even if you don't intend to over-clock. It will provide better airflow and make your hardware run smoother and last longer.

■ 300W power supplies are standard and adequate for today's computers. Look for steady power supplies, as fluctuations in the power will cause lockups and damage hardware.

■ Choose a large cabinet: either a big

mini-tower, or tower cabinet. Make sure that it will hold your motherboard—MicroATX or ATX form factor. This aids ventilation and allows easy access to hardware.

■ Screw mounted blanking plates in the rear (that cover unused bays) are better than those that have to be broken. You can reattach these later when a bay is unused, preventing unnecessary exposure to dust.

■ Look for cases with thumb-screws or slide out access panels that let you open your cabinet easily.

“640 KB ought to be enough for anybody”, said Bill Gates in 1981. Things have changed a lot since then. Storage costs have dropped, and application sizes have increased. With the penetration of the Internet into almost every facet of our lives, online storage has also grown in popularity—it’s free and convenient. With that applauded, the benefits of the service are many—back up, sharing data and of course, a virtual briefcase to carry your business around in.

Since like money, no amount of space is ever enough, online storage is like an accomodating, omnipresent neighbour—everything that doesn’t find a place on your hard disk, can be put online. In limited measures, naturally. Once housed, you can share your stuff or transfer it across geographics.

There are several different types of online storage to

choose from. Some offer a paid solution and others let you store just about anything for free. Yet others are more specific, allowing you to store pictures and photo albums, providing you free Web space, either paid or unpaid.

Web sites that give you e-mail and Web hosting space can be used to store morsels of data. You can also use Web sites that offer high e-mail storage space. All you have to do is create an e-mail account with them, and then e-mail the files you want to back up to that address. Create appropriate folders, and you’re done.

Online Grand canyons

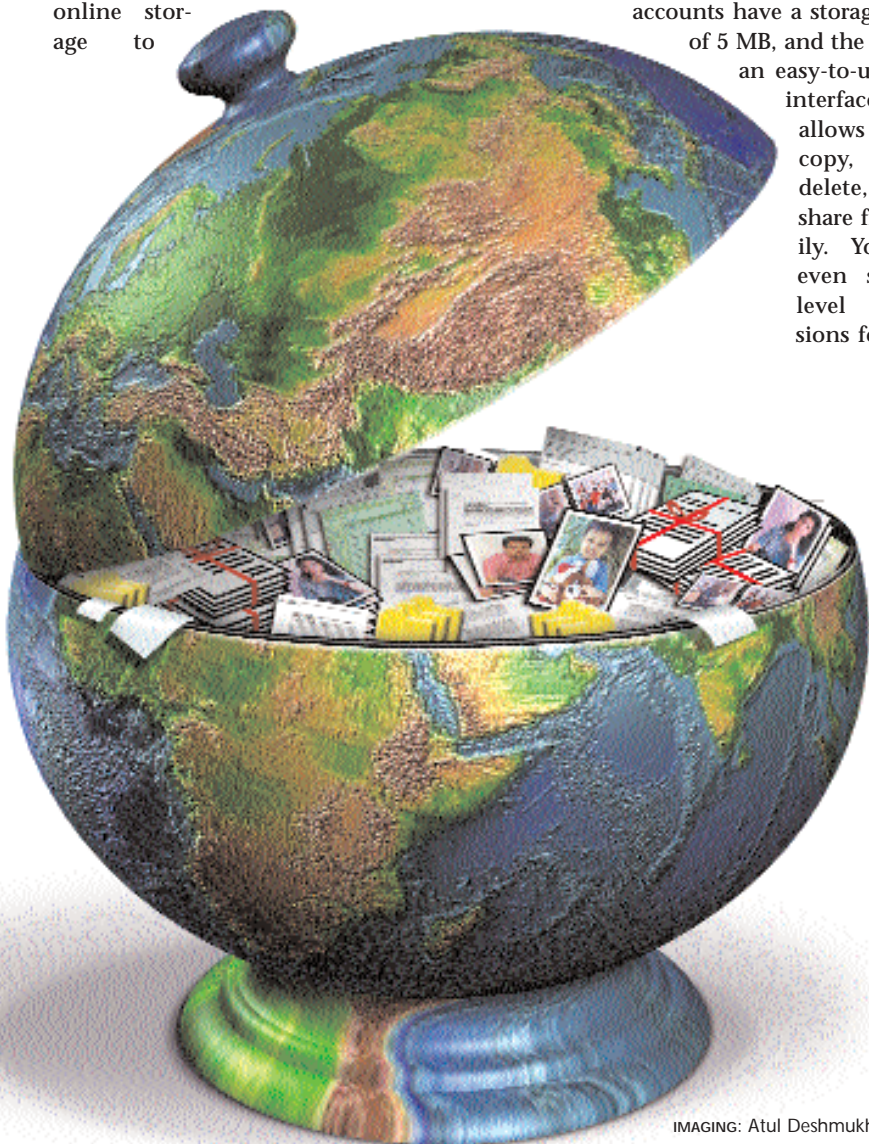
Sharemation.com (www.sharemation.com) is the first name that pops up when you talk of sites that offer free online storage space. This site is actually meant to be used when evaluating the Xythos WebFile server (www.xythos.com). The evaluation accounts have a storage space of 5 MB, and the site has an easy-to-use Web interface that allows you to copy, move, delete, or share files easily. You can even set file level permissions for shar-



Sharemation.com is a great online storage Web site to store your data

ing documents. Permission is granted on the basis of three levels of users—owners, Sharemation account holders and the general public. The address of your Web folder is as simple as <http://www.sharemation.com/<yourusername>>, and you can map this as a drive to easily drag and drop files. Just open Windows Explorer and go to *Tools > Map Network Drive...*, choose a drive letter in the ‘Drive’ field, and type the URL of your Web folder in the ‘Folder’ field. Now click on Finish, and you will be asked for a username and password. Enter them and click OK.

NetDocuments (<https://vault.netvoyage.com/>) offers a free space of 3 MB, with many useful features such as Web folders, e-mail accounts, etc. To sign up, visit [https:// vault.netvoyage.com/neWeb2/signup/signupfree.asp](https://vault.netvoyage.com/neWeb2/signup/signupfree.asp). This site only works if you run Windows with Internet Explorer 5.0,



IMAGING: Atul Deshmukh

It’s Never Enough

Tired of using floppies and CDs to haul your data around? Try these free online storage services and access your documents from anywhere...



Send the file that you need to store as e-mail attachments to NetDocuments

or later. The first time you login, it installs an ActiveX control. When you sign up, an e-mail address is created as <yourusername>@mail.vault.netvoyage.com. To upload a file, just send it as an attachment to that address. To access your Web folder from Windows XP, open 'My Network Places' and double click 'Add Network Places'. Click Next, select 'Choose another network location' from the list of 'Service providers' and click Next. Type <https://vault.netvoyage.com/webfolders> in the address field, and click Next. Enter your username and password when you're asked for it, click Next and then click on Finish. Another interesting feature is its integration with Outlook. You need to download and install a small file, which adds a button to the Outlook toolbar that lets you save messages and attached documents directly into your NetDocuments account.

If you need large amounts of free space, BTInet Storage (<http://webstorage.btinet.net/>) is the choice for you. It's a

plain site, which offers nothing but 25 MB of space, where you can store anything you want.

My Secure Files was earlier known as Freeback.com. It offers 10 MB of compressed space; all the files you upload, are compressed and then stored. One very useful feature is that you can encrypt your documents while storing them. This assures the security of all your sensitive data. To sign up, visit <http://isavix.net/member/signup.jsp>.

Znail.com (www.znail.com) grants 5 MB of real estate, plus unlimited storage for bookmarks. This site has a unique navigation system that makes use of pop up windows every time you click on a link, similar to the dialogue boxes in Windows.

Everything but the kitchen sink

If you like matching your e-mail client to your online storage space, try Yahoo!. Yahoo! offers a combined 30 MB of space in the form of Yahoo! Briefcase and Yahoo! Albums. To access the Yahoo Briefcase, go to <http://briefcase.yahoo.com>. You can use your Yahoo ID to access all Yahoo! services including e-mail, Briefcase and Photo Album. An easy way to upload files to your Briefcase is to send them to your Yahoo! e-mail ID as an attachment, then open the e-mail and click 'Save to my Yahoo! Briefcase'.

Indiatimes (www.indiatimes.com) is another site that offers e-mail, calendar and briefcase services. It offers 6 MB e-mail storage, and 12 MB for the Briefcase. To send attachments to the Briefcase, click 'Down-



Doneasy lets you store files as long as 10 MB

load: My Briefcase' in the attachment description box at the bottom of the e-mail.

Doneasy.com (www.doneasy.com) is an integrated online service platform that offers an e-mail account with 2 MB of storage, calendar, message board, chat rooms, online bookmarks, journal, notepad and file storage with 10 MB of space. The best part of this site is that there is no limit on the individual file size, which means you can upload even a 10 MB file. Although the navigation is a bit difficult to understand, the site is visually appealing.

Web sites galore

If you want to host your own Web site, you have options aplenty. Many Web sites will gladly give you enough space. Some have a limited individual file size, or the types of files that you can upload, but many don't.

Yahoo!, via Geocities.com grants 15 MB of space. It has an individual file size limit of 5 MB, but accepts MP3 and Zip formats.

O-F.com (www.o-f.com) offers 100 MB of free space, but with a file size limit of

The Best of the Crowd

Web site	Address	Space	Pros	Cons
Sharemation.com	www.sharemation.com	5 MB	Web folders can be mapped to the local drive; Allows you to set permissions for shared folders	Small storage space, suited only for document
BTInet	webstorage.btinet.net	25 MB	Large storage space	Can upload files only through the Web interface
MySecureFiles	http://isavix.net/	10 MB	Allows you to encrypt while saving	Can upload files only through the Web interface
Znail	www.znail.com	5 MB	Bookmarks can be stored	Small storage space
Yahoo!	www.yahoo.com	30+4+15 MB	Large storage space; Integrates with Yahoo! Mail and the Photo Album	5 MB limit on the individual file size
O-F.com	www.o-f.com	100 MB	Large storage space	1 MB limit on the file size; Bandwidth restriction of 20 MB per day
Brinkster	www.brinkster.com	30 MB	Accepts Zip files	Lengthy sign-up process, interface cluttered with advertisements
Doneasy	www.doneasy.com	12 MB	No limit on the individual file size	Navigation difficult to understand
ImageStation	www.imagestation.com	Unlimited	Upload photos and videos; Multiple uploading procedures	FTP access missing, support for only JPEG images and MPEG videos
Fotopic	www.fotopic.net	250 MB	Provides page view count; Multiple ways to upload, including FTP, WAP access to your photos, other image formats supported; More space can be requested	FTP downloads not supported

1 MB as well as a restriction of bandwidth to 20 MB per day. The total amount of uploads and downloads should be less than 20 MB per day.

Brinkster (www.brinkster.com) gives you 30 MB of free Web space. The best part is that it accepts the Zip file format, so you can store just about anything you want by zipping the file first. The sign-up process is lengthy, and the interface cluttered with advertisements.

Angelfire (www.angelfire.com) offers 20 MB of storage, and accepts the Zip and MP3 file formats.

eSmartStart.com (www.esmartstart.com) gives 20 MB, with FTP access. This means that you can upload any file you want, but with a bandwidth limitation of 35 MB per day. You can use an FTP client such as CuteFTP (www.cuteftp.com), WS_FTP (http://www.ipswitch.com/Products/WS_FTP/), or BlazeFTP (<http://www.flashpeak.com/blazeftp/blazeftp.htm>) to make use of the FTP facility. You can also open FTP folders in Internet Explorer by typing 'ftp://username:password@sitename.com'. Once the folder opens, you can drag and drop the files through Windows Explorer.

Similarly, www.fortunecity.com gives 25 MB of free space with FTP access. The FTP address is [ftp.fortunecity.com](ftp://ftp.fortunecity.com). You can use 'ftp://username:password@ftp.fortunecity.com' to access your folder with Internet Explorer.

Speak a thousand words

Until recently, the obvious choice for online photo albums was Yahoo Photos, but according to a notification on the site, this free service is going to be made very limited soon. Thus we're forced to look for other options.

Sony's Image Station (www.imagestation.com) is good place to store images and videos online. You can upload images in JPEG format and videos in MPEG format. The individual file size limit for JPG images is 6 MB, while it is 40 MB for videos. You can choose between the standard Web interface to upload your files (maximum 30 at a time), or just e-mail the files as an attachment to a specific e-mail address. In the former, you can install a tool that lets you drag and drop.

Another good Web site is Kodak's www.ofoto.com. This place gives you unlimited space for storing your pictures for 12 months—more if you order prints from here. You can also share your photographs by inviting your friends through an e-mail sent by ofoto.



Kodak's ofoto.com offers you unlimited storage for one year

Fotopic.net (<http://fotopic.net>) gives you 250 MB of space to store your photographs, but even if you use up all this space, you can request for more. When you create photo albums, you get weekly statistics about the viewers. You can also access the galleries from your WAP enabled mobile phone. You can choose to upload photos by the Web interface, by sending an e-mail with the pictures as attachments to upload@fotopic.net, or use the FTP access.



Photos stored at Fotopic.net can viewed on your mobile phone

Photodex PictureCD.com (www.picturecd.com) is another site which offers unlimited space for storing photographs. There is only one way to upload photographs to this site, the Web interface. Whenever a photo is uploaded, you get the option to keep the photo private, or make it public. This allows easy sharing of photographs. The only drawback is that you can upload only one image at a time.

Shutterfly (www.shutterfly.com) is a well-known service for online storage of photographs. To upload photographs, just install a tool from the site. Using this tool, you



Photodex PictureCD.com gives you the option of keeping photos public or private

can select multiple pictures to upload, get the upload progress status, and drag and drop the images from Windows Explorer.

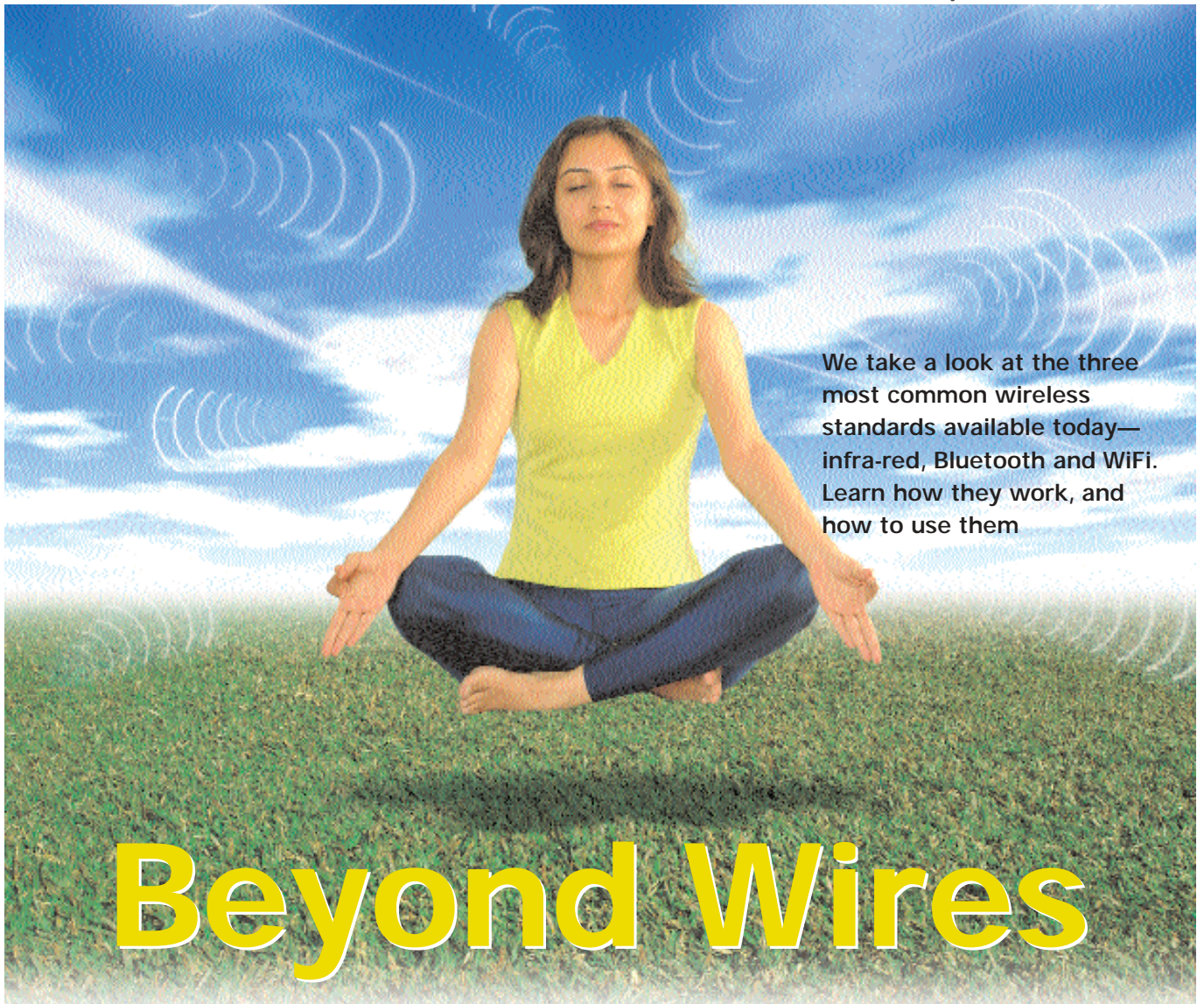
Photogra.com (www.photogra.com) also offers unlimited space to store your photographs online. It allows you to create public as well as private albums. www.photoisland.com on the other hand, offers only 10 MB of space to store the photographs online, but has some cool tools such as an event-specific album creation wizard and sending your photos as an e-card.

Points to ponder

There is one more thing you can do to store your documents—e-mail them as attachments to yourself, and keep them in your mailbox. You should use services that give you larger e-mail storage space—10 MB or more, such as HushMail (www.hushmail.com), Fast Mail (www.fast-mail.fm) and Arabia mail (www.arabia.com).

There are a few things that you need to keep in mind when storing your data online. First, remember that transfer time matters, especially if you are using a dial-up connection. If the file you want to upload is large and the Web site allows compressed files, compress your files using WinZip or other such utilities. Secondly, remember that most of these file transfers aren't very secure, so avoid storing sensitive documents on the Internet. Another concern is thereliability of these sites; earlier, most of these sites were free, but with the ever changing business and Internet scenario, Sites are increasingly becoming paid, or just shutting shop. To counter this, you should store important files at more than one site, so that you can gain access to the data as and when you need it. Also, read the copyright policies carefully and check whether you are abiding by them. ■

UPENDRA SINGHAI
upendra_singhai@thinkdigit.com



We take a look at the three most common wireless standards available today—infra-red, Bluetooth and WiFi. Learn how they work, and how to use them

Beyond Wires

The need for wireless communications arose when people started using more than one electronic device to store personal data, such as contacts, photos, appointments, etc. All this data was stored all over the place: in laptops, PDAs, mobile phones, and even in wrist watches. Using wires for communication beats the very purpose of mobile devices. So, the first wireless standard to gain acceptance in the market was infra-red. Then Bluetooth arrived, and it is slowly but steadily entering the market. These standards, however, had low data transfer rates; so a new standard named WiFi was born. It supports high data rates and is used primarily in laptops for network access.

Infra-red

Infra-red is similar to normal light and is just another electromagnetic wave. It is called infra-red because the frequency and

wavelength takes it below the red end of the spectrum, making it invisible to humans. Infra-red is the simplest and one of the most prevailing wireless communication standards. It uses an infra-red beam to transfer data between devices. Remote controls for various devices—televisions, CD players, air conditioners, etc.—all use this technology. IrDA (Infra-red Data Association) is an organisation that maintains the standard for communication via Infra-red, and there are currently more than 100 member companies and many more devices that have an IrDA port.

Like any other standard, IrDA is a cable replacement standard; it creates a virtual wire using an infra-red beam to transfer data. It is a half-duplex, point to point protocol—only one device can transmit data at a time. Also, the devices need to have a clear line of sight between their ports to function—the IrDA ports of

the communicating devices must face each other without obstructions. The two devices that take part in this communication are called primary and secondary devices. Primary devices are the ones that



Sony Ericsson T310 is a popular IrDA enabled mobile phone. The black rectangle seen here is the infra-red port

How IrDA Works

System support

To communicate with an IrDA enabled device, your computer needs to have an IrDA port. Some motherboard models come with an infra-red port on board, but most include only the IrDA header, which is a connector between the motherboard and the back panel of the cabinet. The IrDA adapter which contains the infra-red transmitter and receiver has to be connected to the IrDA port at the rear of the cabinet. Usually, motherboard manufacturers don't include the IrDA adapter, even if the motherboard has an IrDA port. Read your motherboard manual to find out if you have an IrDA port. If you do, buy an adapter from your dealer.

Another option is to use USB stick-based IrDA ports. Just plug one of these devices into a vacant USB port, install the drivers if required, and your computer is IrDA-ready. These devices are available for about Rs 1,000.

Pros

Being the simplest of the lot, it really doesn't make sense to buy a product for its IrDA unless you have an existing IrDA-enabled device or system. It is best suited for transferring small amounts of data such as schedules, contacts, etc. Use it for transferring data from your system to a mobile device or between two mobile devices.

Cons

Don't use IrDA for transferring large amounts of data between a laptop and a system. Although data can be transferred, the slow data rate and line of sight requirement will make it a very avoidable experience.

Devices using infra-red

IrDA ports are found in personal electronics devices such as mobile phones, PDAs, remote controls, etc. Nokia models such as the 6510, 8250, the Sony Ericsson T310 and T610, the Palm Zire 71, etc., all come with infra-red ports.

If your mobile phone is IrDA-capable, you can transfer ring tones, wallpapers, contacts, etc., to and from your phone. However, you will need to have a mobile phone management utility such as Oxygen Phone manager. Get it at www.oxygenphonemanager.com. Similarly, you can transfer data and synchronize your PDA with your computer.

Interestingly, IrDA-enabled PDAs can be used as substitutes for remote controls. All you need to do is load an application such as OmniRemote (www.pacificneotek.com) onto your PDA, point a remote towards the PDA and press the most commonly used keys. For a television remote, you probably use Channel up, Channel down, Volume up and Volume down more than any other buttons. After you press a key on the remote, you can assign a PDA key to mimic the function. Once you've assigned the keys, you're all set to use your PDA as a remote—secretly switching channels while your father sits guarding the remote, gaping at the swimsuit round of Miss World, is one sure way of getting a few laughs.

look for IrDA-enabled devices through a process called discovery. Once it finds a secondary device, two random 32-bit addresses are generated for each device—even if the same address is generated for both devices, there are mechanisms to resolve them. Once the addresses are assigned, a connection is established and the devices figure out each other's capabilities: supported data rates, data size, turnaround time, etc. After these rituals, the data transfer commences at the highest supported speed. A 'permission to transmit token' is used, which ensures only one device talks at a time. Only the device possessing the token can transmit data. Though more than two devices can communicate with each other, only one can talk.

There is no fixed speed for IrDA devices, but all devices need to be capable of at least 9.6 Kbps, as this is the speed at which initial discovery and negotiation takes place. Currently, the maximum supported speed is 4 Mbps, but a 16 Mbps standard is in the pipeline. IrDA devices can be up to a metre apart, but work best within a range of 5 cm to 60 cm. As IrDA commu-

nication happens only by conscious effort of a user, the range is short and security isn't considered an issue—there isn't any in the standard.

Bluetooth

Bluetooth is designed to be a personal area network, where participating entities are mobile and require sporadic communication with others. It's omni directional; i.e., it doesn't have the line of sight limitation like infra-red does. Ericsson started the work on Bluetooth, and being a Denmark-based company, they named it after the Danish king Harold Bluetooth. Later, a Bluetooth special interest group, comprising companies such as Nokia and Ericsson, was formed to oversee the development and standardisation of the technology.

Bluetooth operates in the 2.4 GHz area of the spectrum, and provides a range of 10 metres. It offers transfer speeds of around 720 Kbps. When

Bluetooth devices are connected to each other, they form a network called piconet. Each piconet can have a master, and up to seven slaves. Communication takes place only between the master and the slave. If the slaves need to communicate with each other, they can't route via the master—they have to form a separate piconet. A device can participate in more than one piconet at any given time—it can be a slave in one piconet, and a master in another. Such networks are called scatternets, where different piconets are connected using a common device.

To accommodate interference from other signals, Bluetooth uses frequency



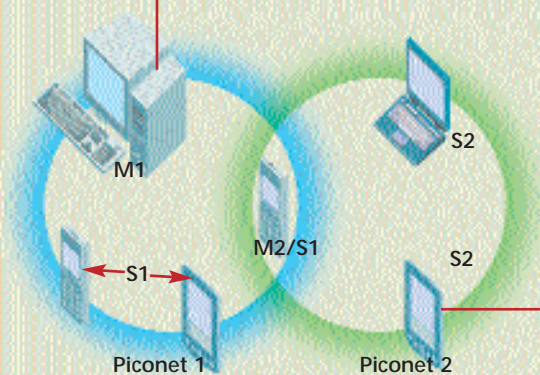
Not just mobile phones and PDAs, Bluetooth can be used for other wireless applications like this Microsoft Bluetooth keyboard and mouse

How Bluetooth Works

System support

The easiest way to enable Bluetooth support in a system is to attach Bluetooth USB sticks. Some motherboards, such as the MSI KT3 Ultra2-BR, come with inbuilt Bluetooth support. Once plugged into the system, you'll have to install the drivers for the device to start using it. The system will then periodically scan the surroundings for Bluetooth devices.

There are two piconets shown here; the master of each network is indicated by M1 and M2. Similarly, S1 and S2 indicate the slave devices of Piconet 1 and 2 respectively. Note that M2/S1 is a device that is the master in piconet 2; at the same time, it is a slave in piconet 1



Devices using Bluetooth

Bluetooth is slowly beginning to reach the hands of consumers. Most premium-range mobiles and PDAs support Bluetooth; it has started appearing in the mainstream range as well. Users buying mobile phones, or PDAs should look for Bluetooth enabled devices. Using Bluetooth, you can transfer contacts, ring tones, images, etc., between devices easily.

Pros

Currently, Bluetooth offers the best solution for hassle-free communication between portable devices. With low power consumption and user friendliness, Bluetooth has all the requirements of a

personal area network. Those who need to transfer data on a regular basis and prefer portable device should definitely opt for Bluetooth.

Cons

In spite of promises that Bluetooth support will be

cheap, consumers avoid it mainly due to cost. A Bluetooth USB stick costs about Rs 2,000, which may be on the higher side for mainstream customers. Don't think of this technology as a LAN replacement, though.

hopping. The devices frequently change the frequency at which they operate—as often as 1,600 times a second. This prevents interference with other devices that may be operating at the same frequency. When a piconet is formed, the master informs all the slaves of the frequency hopping sequence, and the slaves follow these instructions.

To conserve power, devices can go into three modes when they aren't actively involved in a piconet. In increasing order of power consumption, they can be in park mode, hold mode and sniff mode. All the slave devices in a piconet are assigned an active member address (AM_ADDR). When a slave enters the park mode, it will give up its AM_ADDR and get a park address, PM_ADDR. The parked devices will listen to the master at regular intervals, allowing them to conserve power, and will yet be able to rejoin a network when required. When a device enters hold mode, it is assigned a hold timer and no data transfer takes place until the timer ends. In sniff mode, the device retains its AM_ADDR, but reduces its role in the piconet, thus conserving power. This mode is flexible, and parameters such as sniffing interval can be programmed.

One of Bluetooth's advantages is that it can handle both data (asynchronous) and voice (synchronous), which others such as infra-red can't. One must under-

stand that the requirements of a voice and data channel are very different. A data channel needs to be strictly error free while it can tolerate timing errors, for a voice channel it is exactly the opposite. Both synchronous and asynchronous channels can be handled simultaneously. This has led to products such as Bluetooth headsets for mobile phones; these headsets allow users to talk via the cordless headsets while the mobile phone resides in their pockets.

Every Bluetooth device has a 48-bit BDA (Bluetooth Device Address) burned into its ROM. This address can't be easily changed by the user. Similarly, each device can be given a user-friendly name such as 'Sachin's mobile'. These names will make it easy for the user to identify a device in a piconet. A Bluetooth device can be set to periodically scan for other devices in its vicinity, or users can perform manual scans. After a scan is performed, a list of all Bluetooth devices detected is shown. Each device in the list will have the name assigned by its respective owner, and the user can select a device and communicate with it. A Bluetooth device will show up in a scan only when it is in discoverable mode. Discoverable mode should be turned off to prevent bluejacking—sending anonymous messages to users via Bluetooth.

WiFi

Bluetooth is a convenient way of communication for a personal network, but it is not suitable as an LAN replacement, or for perennial data transfer. But the growing popularity of laptops necessitated the need for a wireless standard that would allow people to walk around with their laptops, and still be connected to a network. WiFi, an abbreviation for Wireless Fidelity, is a wireless standard that promises mobility while offering data rates comparable to those of a wired LAN. WiFi is a collection of standards ratified by the IEEE (Institute of Electrical and Electronics Engineers). In 1997, IEEE approved the 802.11 standard, which laid down the specifications for wireless LAN. Subsequently, revisions were made to this standard and these resulted in three other standards, namely 802.11a, 802.11b and 802.11g. The entire family of 802.11 standards are collectively called WiFi. The letters appended to the standard



The Apple Airport can be plugged into a Mac system to make it WiFi compatible

How WiFi Works

System support

For a system to connect to a WiFi network, it should have a WiFi network card, or an access point connected to it. WiFi network cards are like normal network cards that plug into PCI slots, but have a protruding antenna. It's also possible to plug an external WiFi adapter into a USB port. Once the network cards are installed and configured, the system can connect to any WiFi network. Hardware access points can be connected to network equipment such as a bridge, or it can be connected to a system that has access to a wired network. It's also possible to install software that will convert the system into an access point. Hardware access points are generally used in commercial hot spots, while software access points are used to share an Internet connection in homes and SoHos.

Ad hoc WiFi network

Pros

Given the current situation, WiFi should be adopted when there is a demand for high speeds on the move. WiFi is suited for corporates with several executives roaming around the office with their laptops. Homes looking for a means to share a broadband Internet connection can also consider adopting WiFi. If you're buying a laptop, look for WiFi-enabled devices.

Cons

A WiFi setup is rather expensive when compared to a regular LAN. Also, since WiFi drains batteries much quicker, PDA users should avoid using it—especially if they have a Bluetooth option available. It is difficult to provide security in a WiFi network, as it is difficult to control access to the network.

Devices using WiFi

While WiFi may be widely used for communication between computers, there are PDAs that support it. It's also possible to add WiFi support to a PDA by inserting a WiFi card into the SD (Secure Digital) slot. PDAs such as the Toshiba e750 have inbuilt support for WiFi. In March 2003, Nokia announced plans to build mobile phones that can seamlessly switch between 802.11b and public networks. The major problem with WiFi is the high power consumption, which mobile devices just can't afford.

indicate the task group that proposed the modifications. For example, task group 'b' put forth the 802.11b standard.

A wireless network can work in two modes; namely ad-hoc and base station. In an ad-hoc (also called peer to peer) network, several computers equipped with wireless hardware come together to form a network. All the computers communicate with each other directly. Unless one of the computers participating in the ad-hoc network is connected to a wired network, no system can gain access to a wired network. Three friends meeting in a park and sharing files between their wireless laptops is an example of an ad-hoc network.

The other type of network involves the use of an access point (also called base station). The access point acts as the central point of the network, and is the link between the wired and wireless networks. An access point can be a dedicated hardware system, or just software running on a system. In airports and coffee shops, mainly in the US and Europe, access points are provided so that customers can walk into the shops and start using the Internet from their laptops. It may not be possible to cover an entire airport, or an office, with a single access point. In such cases, more than one

access point is required. Users can take their devices and roam across different access points. All access points have a SSID (Service Set ID) assigned to them, as do all the clients connected to them. When an access point is installed, the default SSID must be changed to increase security, and to prevent users from connecting to some other spot.

The name WiFi was first given to the 802.11b standard. Approved in 1999, 802.11b offered extensions to the original 802.11 that improved the highest data rate from 2 Mbps to 11 Mbps. It operated in the 2.4 GHz frequency range, like as the original and has a range of about 300 feet. Keep in mind that range and speed are interrelated—as the wireless clients move further away from each other, the speed is bound to deteriorate.

802.11a is a standard that operates at a frequency of 5 GHz, and hence it is incompatible with 802.11b. So, a laptop with an 802.11b card can't connect to an access point running on 802.11a. Also, the range of 802.11a is lower than that of 802.11b; hence, more access points are needed to cover a large area. On the brighter side, it offers a much higher throughput of 54 Mbps. Interference is a problem with wireless networks. Bluetooth devices and cord-

less phones are some sources of this interference. 802.11a is less susceptible to interference when compared to other standards such as 802.11b.

To solve the limitation of 'b' and at the same time provide the speed of 'a', the 802.11g was introduced. 802.11g offers speeds of 54 Mbps, while maintaining compatibility with 802.11b networks, so a laptop with a 802.11g card will be able to use a 802.11b access point.

WiFi has a basic level of security provided at the physical level, called WEP (Wired Equivalent Privacy). But vulnerabilities in WEP have already been discovered, and it can't be used as the only security mechanism. However, it is recommended that WEP be turned on, as it provides a basic level of security. Additional levels of security can be provided at the software level in the form of firewalls. The level of security offered by WEP depends on the number of bits used for the encryption key; almost all WiFi products come with a 40-bit encryption key. A 104-bit encryption key is also available, and it is recommended that the largest available key should be used. ■

MOULY ARUN PRABHU

mouly_arunprabhu@thinkdigit.com

30 Minutes Expert Fonts Sans Confusion

Thousands of fonts and nowhere to run...Welcome to your destination

Most designers and artists who use and manage a large number of fonts will empathise. Fonts take up a lot of space, and are difficult to manage. Everyone needs to know how to manage fonts, and it isn't as simple as it seems. Windows has to load all the installed fonts at system startup; applications such as Photoshop load fonts when they start. The more the fonts installed on the system, the slower it runs. A lot of programs also have their own fonts that are installed without your knowledge when you install the program. This makes font management an important aspect of maintaining PC health.

Designers, who use large number of fonts, may need to use a font management tool. Using these tools, you can split the fonts into groups and load only the necessary ones. Others need to make sure that they have no unwanted or corrupt fonts, as these can cause a system crash.

Windows keeps all the fonts in a default folder (<Drive>:\Windows\Fonts), where <Drive> is your Windows default drive. Backup this folder, so that if you accidentally delete an important font, you can restore it later. To view the fonts currently installed on the system, go to Control Panel and open the Fonts applet. The default font folder will be shown. Remove the unwanted fonts by selecting the font and pressing [Delete]. If the folder

contains fewer than a hundred fonts, then it's recommended that you don't delete any. Otherwise delete the unwanted ones. Remember, however, that certain fonts such as Times New Roman are used by Windows, so don't delete them. Go to <http://graphicssoft.about.com/library/extra/bldefaultfonts.htm> to know more about what fonts to keep.

If you absolutely need to have a lot of fonts, the only solution is to categorise them and install only the ones you need. You can do this manually, or leave it to specialised utilities such as Typograph (<http://www.neuber.com/typograph/>). Essentially, what you need to do is keep the font files in different folders and load only the ones that you need to work with.

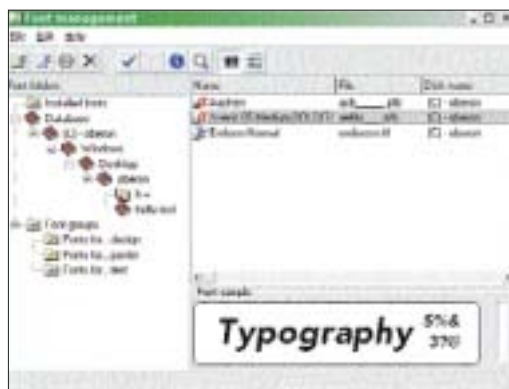
You can group the fonts based on the project you are working on, or on the type of font—normal, stylish, symbols, Indian scripts, etc. Now, keep only important fonts in the default folder and delete the remaining ones. Group the ones you deleted in a backup folder. If you want a font in more than one group, just create a copy.

Now, to use Typograph to manage your fonts, open the application to see a list of all the fonts installed on your system.

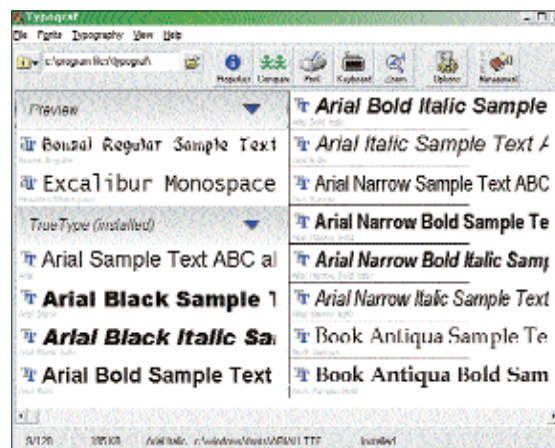
You can double-click on any font to view its complete details. Click on the button named 'Management' in the toolbar, and you will see a font management window—similar to a Windows Explorer window. Click on the button with a CD symbol (the archive button); in the dialog box that appears, navigate to the folder where you stored your groups of segregated fonts. At the bottom of the dialog box, select the 'Take directory structure' radio button, and click on Continue. The number of fonts found will be displayed. Now click 'All'.

TIPS If you have certain fonts that you use only with Adobe applications, you can put them in the '<Drive>:\Program Files\Common Files\Adobe\Fonts' folder, where <Drive> is your Windows default drive. This will ensure that the fonts do not load at Windows startup, but are available to any Adobe applications

The right pane of the Font management window has a database entry; expand it and you will see all your fonts neatly categorised. You have the option of either loading a particular category, or installing it. Loading a font makes it available for the current Windows ses-



The Font management window is easy to use, and looks like Windows Explorer



Typograph lists the fonts currently installed on your system according to their font families

sion, and will not be available when you restart the PC; installing a font will make sure that it is loaded at startup for every Windows session. All you have to do from now on, is right-click a font category and choose to Install, Uninstall, Load, or Unload it.

Play around with Typograph to find more useful features such as font comparisons, keyboard layouts of symbol fonts, and details about the fonts used.

MOULY ARUN PRABHU
mouly_arunprabhu@thinkdigit.com

Watch that Move

Prevention, as they say, is better than cure, and this goes double if you are a road warrior living off your laptop

Securing your laptop is easier said than done; the very fact that laptops are so mobile makes them attractive and easy targets. Losing your laptop is not just losing really expensive computer hardware—if your laptop is your main computer at work, then it can also mean the loss of several hundred hours of work. And if you happen to be a corporate hotshot (which you'd have to be to get one in the first place), there goes all your hush-hush company information.

It's a big bad world

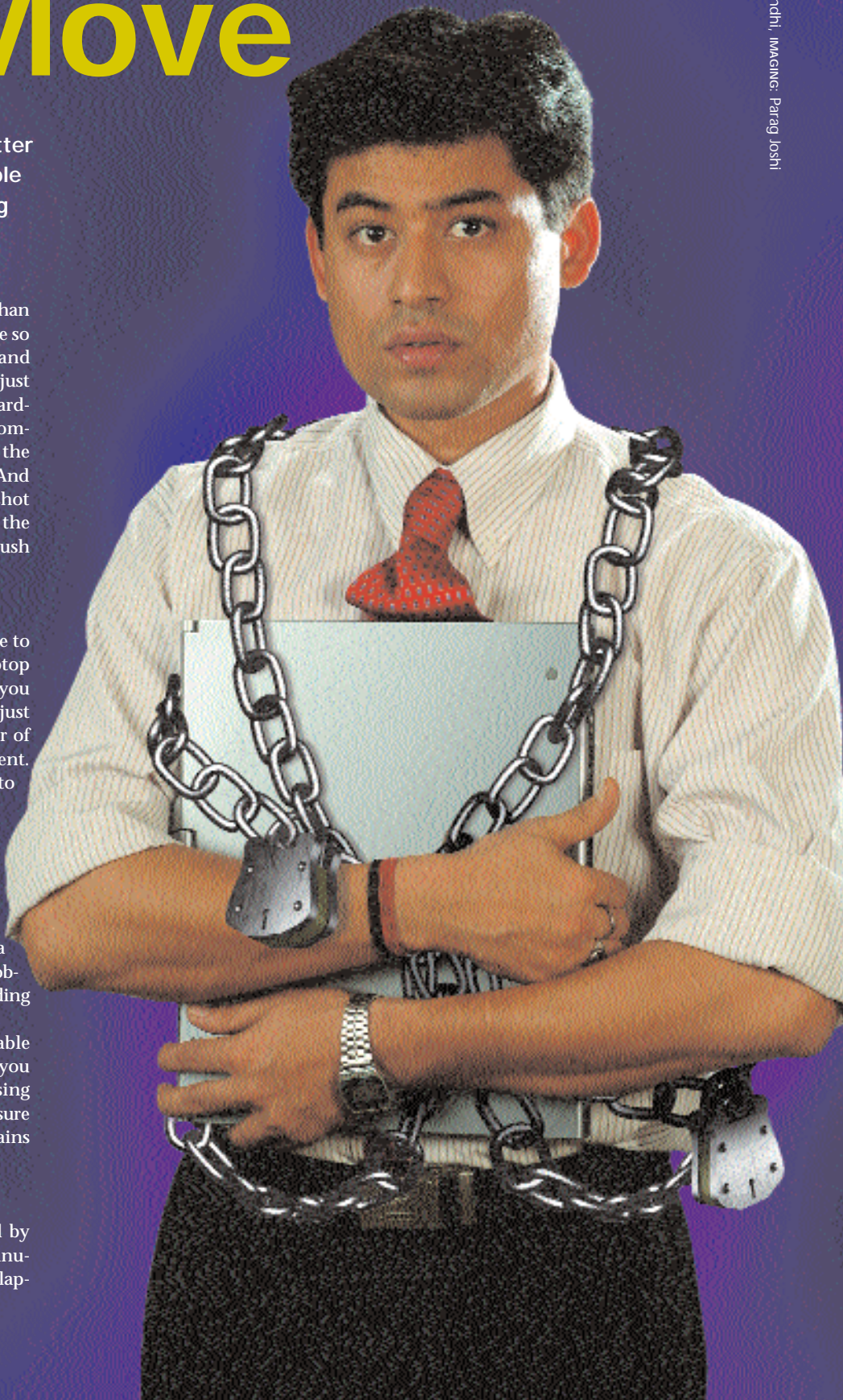
Security means that you should be able to foresee the possible threats to your laptop and the data residing in it. Whether you take your laptop all over the world, or just from home to work and back, the fear of physical loss of the laptop is omnipresent.

Not all laptops are stolen and sent to the local chop-shop to be resold; smart thieves will target laptops to pick up data that is otherwise inaccessible from workstations behind company firewalls. Third-party software tools that will restrict logins and encrypt drives are your best bet against data thieves. The Bill Gates' of the world probably have a posse of security men guarding their laptops.

There are hardware locks available that will let you secure your laptop as you would your bags on a train. Also, using commonly available tools, you can ensure that even if it's stolen, your data remains safe.

Hardware paranoia

Securing your laptop is best achieved by locking it down... literally! Laptop manufacturers provide a little slot with each lap-



PHOTOGRAPH: Jiten Gandhi, IMAGING: Parag Joshi



The security slot will keep your laptop where you last left it

is connected to a steel rod within the chassis; trying to take apart the rod is as good as breaking the laptop. The slot can be identified by a little lock icon, with the letter 'K' on it.

Hardware security devices available in India range from the simple, to the sophisticated. At the bottom of the list are ordinary devices that lock into the security slot and have a tough steel cable to wind around a table leg or some permanent hook-like fixture. This prevents a crook from just picking up your laptop and walking away with it. We looked at a mechanical device, that has a combination lock and



The Targus DefCon 1 PA 400 motion sensing device secures your laptop



The plain and effective mechanical lock and chain that keep your laptop in place

comes with a 1.5m length of tough steel cable around it. Setting it up is simple: attach the device into the security slot, wind the cable around a table leg (or use the supplied steel hook that can be mounted on a wall) and lock it. This device works great if you tend to be less mobile. Short of sawing through the thick steel cable, the table leg, or trying to break the code on the combination lock, you can't steal a laptop with this device protecting it.

There are more sophisticated devices available that work with inbuilt motion sensors. We found that Targus's DefCon 1 systems (www.targus.com) allow you to set sensitivity levels on a motion sensing equipped device; one particular model, the PA 400, lets you connect a clip-like device into the security lock, loop a steel cable through it and lock it into the motion sensing device. Shake the laptop or the motion sensing device, and an ear-splitting alarm sounds. You can only turn it off by unlocking the three-digit combination lock and undoing the cable. This should be enough to grab the attention of everyone who isn't already deaf and also give the potential thief a good scare. An even more sophisticated DefCon 1 product, the PA 430B, comes with a motion sensing device, cables, a clip and also has a remote control that lets you trigger the alarm by proximity as well as motion detection. Move the tiny remote controller beyond 12m from the laptop and the alarm goes off. You can also trigger the alarm by pressing on a button in the remote controller. This device is ideal for travelers who can secure their laptops whilst travelling in high-risk public areas such as airports. Both these security devices will not allow you to access the battery compartment until you unlock the device, so somebody intent on stealing your laptop cannot disable the alarm. Keep in mind that while these devices are relatively secure, there is still nothing like total security; at best they provide a deterrent to stealing your laptop.

Secure the insides

It's possible that despite all your best efforts, you might still lose your laptop. If you are insured, there will be negligible financial loss, but what about the data sitting on your hard drive? Corporate espionage is a growing problem; the confidential data on your machine may of immense value to the competition. Even e-mail and ordinary correspondence can be a source of information. Your only shield here is making sure

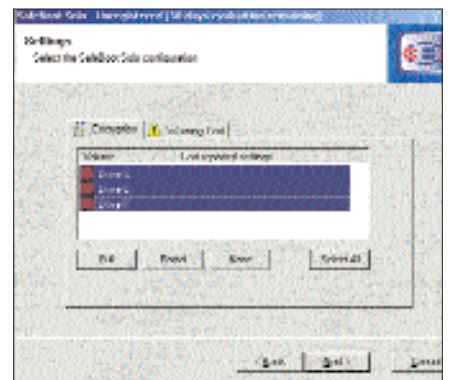
that the computer cannot be accessed by anyone but yourself, and that the data is still unreadable should someone try to swap drives—BIOS and Windows passwords are not adequate security. Use a relatively more secure OS such as Windows 2000 or Windows XP that does not allow users to log in without valid user accounts, and patch the OS with the latest service packs. Then use commercial tools to further secure and limit access. To this end, we worked with two tools, both of which offer substantial boot-time security and real-time drive encryption features. The tools used here are Eracom's ProtectDrive and SafeBoot Solo—they can also be used to secure your desktops.

To run these tools, you need to have a Windows-based laptop with a little hard drive space and blank formatted floppy diskettes. You will be prompted to create rescue diskettes at installation, which can be used to recover from hard drive failure, or from a corrupted setup. These are administrator diskettes and that they can be used to log in to your machine, so store them safely.

SafeBoot Solo

SafeBoot Solo (www.safeboot.com) is simple, easy to use and is shareware—after the trial period expires, SafeBoot will delay boot-up by a minute. It allows for simple configuration and is a very easy-to-use tool.

Installation: Installing SafeBoot is a two-step process—installation and configuration. Double-click on the setup file to start the installation. Once installed, you are prompted to reboot, after which a simple configuration process starts. First up, you will be prompted to enter a username and password, which you will use to authenticate, as well as change SafeBoot's settings. Now you can opt to encrypt all or some of your drives—either partial or complete encryption. A partially encrypted



Encrypting drives using SafeBoot



Log in before you boot up with SafeBoot

drive has 10 per cent of its drive volume encrypted. You can use this to try out drive encryption, but ideally, choose to encrypt the whole drive. You can also create a custom warning message at boot time.

After this, the installer starts copying all the additional setup files. Keep a blank formatted floppy diskette handy, as you will be prompted to create a rescue diskette. Once done, you can extract it from the drive. If you chose to encrypt drives, then SafeBoot will conduct the drive encryption operation immediately. You can choose to either reboot, or continue working with SafeBoot in the background; you can also stop and restart it later. To view the status of encryption, just right-click on the SafeBoot icon and choose Show Status.

Booting up: The primary aim of any security tool is to prevent unauthorized users from logging on to the computer. With SafeBoot installed, you are presented with a login screen when the computer is turned on. On the SafeBoot login screen you will also find additional options to either boot from hard drive or floppy—these options are accessible from the Options button. Once you authenti-

TIP The AES algorithm is the current data encryption standard approved for usage by the US government. It arose as a result of a world-wide competition for a next generation encryption algorithm for NIST (National Institute of Standards and Technology).

cate, Windows boots up normally. **Usage:** While you work with Windows, SafeBoot resides in the system tray. Double-clicking on the SafeBoot icon launches your screen-saver and locks your computer. You need to re-enter your Windows password to continue working.

Drive Encryption: While SafeBoot forces you to authenticate before Windows loads up, to safeguard your data, you should encrypt your hard drives. This will prevent someone from just removing your hard drive and reading your data on another laptop. SafeBoot's encryption works on a real-time basis—files read from an encrypted drive are encrypted and decrypted on the fly. SafeBoot does not offer you a choice of encryption algorithm. It uses the AES algorithm (the Advanced Encryption Standard) implemented with 256-bit security.

If you have not encrypted your drives during installation, you can do so by right-clicking on the SafeBoot icon in the system tray and choosing Configure. You need to enter your username and password. You will also be prompted to reuse the rescue disk you created earlier.

ProtectDrive

Eracom's ProtectDrive (<http://www.eracon-tech.com/products/pd/pdrive.htm>) is a highly configurable tool. This is purely commercial software—the demo version is insecure and displays the username and password of the ProtectDrive administrator.

Installation: Installing ProtectDrive is a two-step routine: launch the pre-installation program by double-clicking on the setup file. After you agree to the license



Choose your flavour of encryption security, between IDEA or DES and PACT

agreements, ProtectDrive copies the main setup files to the hard drive and prompts you to reboot. Following a reboot, the main installation program starts. Keep a formatted floppy handy, as you will have to create a rescue disk. You need this disk to recover from crashes, failures and also to uninstall ProtectDrive. After creating the rescue disk, you head off to the Configuration Options screen, where you can set options for both the ProtectDrive Administrator, as well as other users, such as allowing them the password recovery option and synchronizing to local Windows accounts, as well as setting the minimum length of the password.

The default values work fine, but if you're paranoid, avoid the synchronization and increase the minimum password length. Now you can choose the encryption algorithms that you want—DES (Data Encryption Standard) offers 56-bit security, the proprietary PACT algorithm that uses a 64-bit key, or the IDEA (International Data Encryption Algorithm) that uses a 128-bit key.

The higher the encryption key size, the more time you'll spend encrypting and decrypting data—keep this in mind while choosing your algorithm. Finally, the program files are copied on to the hard drive.



Booting up with ProtectDrive

Tracking it Down

Welcome to the world of laptop squealers; like the 'LoJack' tracking device mounted on vehicles to identify and track stolen vehicles, there exist tracking software utilities that beep their location as soon as the laptop gets online. Checkout services such as AbsoluteSoftware's CompuTrace service (www.computrace.com), zTrace (www.ztrace.com), or Stealth Signal

(www.stealthsignal.com). You have to install the software and pay a rental for the service, generally yearly. Once you report your laptop stolen or lost, it is tracked and the information is shared with local law enforcement agencies. Unfortunately the services are not cheap—in excess of \$40 per year of usage. Moreover, the services appear to be partial towards the US.

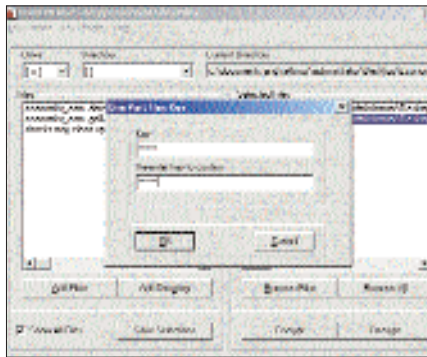
If you have chosen to synchronize ProtectDrive and the local Windows user database, you authenticate with the same Windows passwords and usernames. The final step in the installation is when you will be prompted to encrypt your hard drive. Choose to reboot and encrypt the drives later.

Booting up: ProtectDrive provides a pre-boot authentication sequence to prevent unauthorized users from booting up your computer. After the BIOS detects the hardware, you need to authenticate to let the computer boot-up. ProtectDrive accepts three incorrect login attempts, after which the computer reboots and the login screen is displayed after a one-minute delay. Enter the correct username and password (usernames are case-specific) to start the Windows boot process. If you have synchronised the Windows accounts with ProtectDrive, you don't need to log on to Windows.

Unlike SafeBoot Solo, you don't have any additional options while booting up.

Usage: After logging on to your account, ProtectDrive informs you of all successful and unsuccessful login attempts. If you run Windows XP, you can

TIP IDEA is an algorithm that has been crypt-analysed for several years now without showing any apparent weaknesses



Set pass phrases and secure those files and make sure no one can read them

played on top. You can choose to either encrypt the whole drive, or just the system areas. For optimal security, choose full drive encryption. Depending on the encryption option, you can choose to encrypt the drive volumes using either 56, 64 or 128-bit security.

The encryption priority can be set to low, normal, or high. Selecting low will allow you to continue working through the encryption process. Depending on how powerful your computer is, encryption could take a while.

Encrypting Files: You can use ProtectDrive to encrypt individual files. To do so, go to *Start > Programs > ProtectDrive* and select *Encrypt-Decrypt Files*. In the left pane, choose the files that you want encrypted and click on *Add Files*. Select *Add Directory* to add all the files in a directory. Now choose the files from the right pane and select *Encrypt* to open the encryption menu. Depending on the settings (key format) that you have selected, you will be prompted to enter the keys. The encryption tool uses the encryption algorithm that you have specified during installation. If you would like to tweak the available options, go to *Key Format* and choose the

TIP DES is not considered secure anymore by the US government for military grade encryption



Encrypting your drives is as easy as choosing the drive, the algorithm, the priority and starting the encryption

lock your computer by double-clicking on the ProtectDrive icon in the system tray. If you have shared folders, ProtectDrive will not permit access unless a valid username is used; guest accounts also have to be password protected.

Encrypting hard drives: Go to *Start > Programs > ProtectDrive* and select *Encrypt-Decrypt Hard Drives*. Select the drives you would like to encrypt from the list dis-



Change logon options, set warnings right from the Advanced Configuration Options applet

Track those Crooks

Perhaps of more interest to laptop users is the recent foray of companies such as Phoenix towards developing technologies that deter unauthorised access. Phoenix, for example, is developing an interesting add-on to the BIOS software that they have been developing for decades. The newly developed Core Managed Environment TrustedCore NB for laptops and tablet PCs boasts of cryptographic capabilities built right into the BIOS. This can be used to authenticate digital signatures and restricting access to stolen hardware. It will also protect core system software from malicious code.

Phoenix had earlier partnered with Softex to develop a tracking system which installed on the Core Management Environment. The software connects to the TheftGuard site once a laptop is connected to the Internet, thus making it easy to track it down.

format of the key and Key Length. Decrypting files is just as easy, and is done using the same method, except that you are prompted for your password and need to click on *Decrypt* instead.

Advanced Configuration: ProtectDrive has several advanced configuration options built into it. You can access and change these, provided you are logged on as the ProtectDrive administrator. Go to *Start > Programs > ProtectDrive* and select *Advanced Configuration*. You can also choose to show additional logon information, change the way you log on, remove the status bar icon, etc.

Security first

The security tools we used here may not be infallible, but they do offer good security against all, but the most determined crooks. They are not easy to circumvent; certainly, cutting through a length of toughened steel cable, whilst being deafened by a 110 decibel alarm siren is not easy. Nor is it easy for the average crook to crypt-analyse encrypted data and without access to some pretty substantial computing resources.

With the right equipment and careful practices, you can keep your data and laptop safe, and with you always.

SRINIVASAN RAMAKRISHNAN
srinivasan_ramakrishnan@thinkdigit.com



IMAGING: Solomon Lewis, PHOTOGRAPH: Jiten Gandhi

The FAX of the Matter

Need to send a fax urgently and no fax machine in sight? Oh well, you always have the PC!

Your boss needs you to send some documents across to a client ASAP and get an answer from them too. E-mail? Yes, you can, but don't even begin to think of an immediate response! Fax it then. Yes, but er... your organisation never found the need for a fax machine. Fear not! Turn your PC into one! Surprised? Don't be. It functions just as well as a fax machine. And your boss will be all smiles at your cheap initiative!

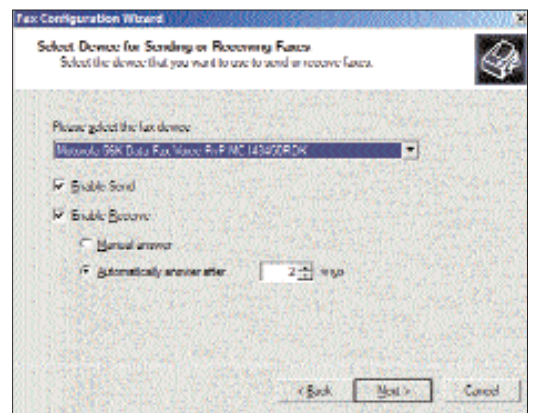
The most basic things you'll need to get started is a PC, a modem with fax capabilities and a phone line. If you have all three, you're all set to use your PC as a fax (Facsimile Transmission) machine. If you have Windows 2000 or XP, just use the bundled Microsoft Fax utility. There are many ways your PC can act as a fax solution: fax via e-mail, which is basically nothing but an e-mail with the fax as an attachment, or you could choose to set up a fax server, which

lets any one in your organisation send a fax to anyone using your PC as a server—very cost effective, as everyone in your organisation can send faxes using just one modem and one phone line (see box 'Setting up a fax server'). If you're looking for additional functions such as those mentioned above, you'll need to get Symantec's WinFax PRO 10.0, downloadable from <http://www.symantec.com/winfax/>, or BVRP Software's PhoneTools Expert, which you can get from <http://www.bvrp.com/ENG/products/PhoneToolsexpert/>.

The fax within

Though Microsoft Fax comes bundled as a part of Windows, it is not installed by default. To install it in Windows XP, go to *Start > Settings > Control Panel > 'Add*

or Remove Programs' and then click on 'Add/Remove Windows Components' to start the Windows Components Wizard. In the Components list, check 'Fax Services', and then click Next. If you haven't

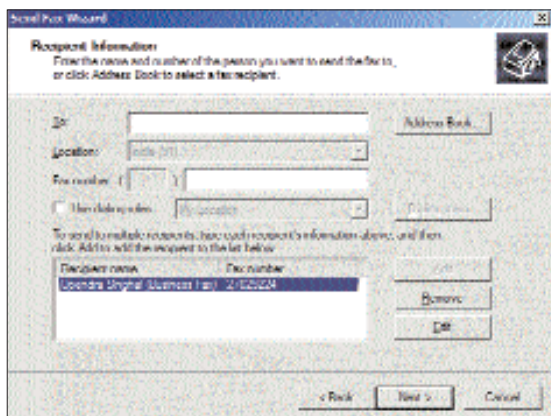


Specify the modem and send / receive settings for Microsoft Fax in Configuration Wizard.

installed the modem yet, it starts up the Add New Hardware wizard to do so. If prompted, insert the Windows XP installation CD, and then click OK. Finally, close all the windows.

In case the PC runs Windows 98, you can install Microsoft Fax from the Windows 98 installation CD. Browse to *Tools\OldWin95\Message\US* and run *Wms.exe* first and then *Awfax.exe*. Configure Microsoft Fax by going to *Start > Programs > Accessories > Communications > Fax > Fax console* to bring up the Fax Configuration Wizard. Click Next on the Welcome screen and fill in the Sender's Information such as name, address, etc., in the next screen. This information appears on the fax cover page. Click Next, and choose the modem that you want to use to fax. Here, check the appropriate option to specify whether you want to use that modem only to send or receive faxes, or for both the tasks. If you choose to receive too, you will have the option of manually answering the call or answering it automatically after a certain number of rings. Setting it to receive automatically is useful, especially when you want your PC to receive faxes in your absence.

Click Next and type in the Transmitting Subscriber Identification (TSID) that usually consists of the sender's fax number and name, and appears in the header area of a received fax. In the next screen, type in the Called Subscriber Identification (CSID) that appears on the sender's machine and helps ensure that the fax is sent to the correct recipient. Click Next and you are asked what to do when a fax is received. Choose 'Print it on' if you want the fax to be printed automatically. You can also choose to create a local copy of the fax received by clicking 'Store a copy in a folder' and specifying the folder.

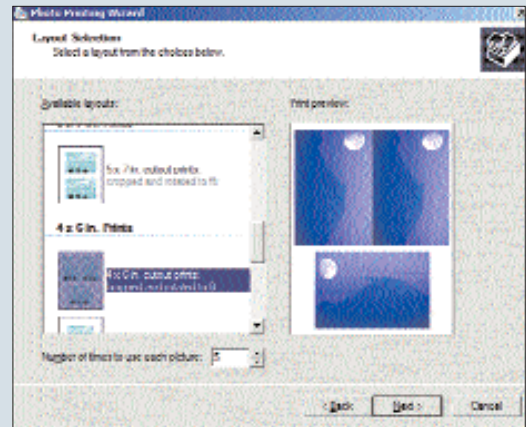


Specify the recipient's information for Microsoft Fax in Send Fax Wizard.

Image Faxing

Windows XP has a Windows Pictures and Fax Viewer that comes in handy when faxing an image or a scanned document. Open Windows Explorer and navigate to the image file. Double-click or right-click the file icon, click *Open With > Choose Program...* and choose Windows Pictures and Fax Viewer from the program list and click OK. When the viewer opens the image, click the printer icon on the toolbar, or press **[Ctrl] + [P]** to print the image. This will bring the Photo Printing Wizard. Click Next to move to the Picture Selection screen. Enable the checkmark for all those images that you want to fax. Click Next and choose Fax as the printer in the Printing Options screen. Click Next to move to Layout Selection screen.

Here you can choose the layout, i.e. the



Use the Photo Printing Wizard to fax scanned documents

number, size and orientation of images on the page. When you click Next on this screen, the Send Fax Wizard will start. Follow the steps of this wizard to send the fax.

er. Click Next, review the settings you chose and click Finish to complete the configuration. You may change the settings anytime by going to *Tools > Configure Fax* in the Fax Console.

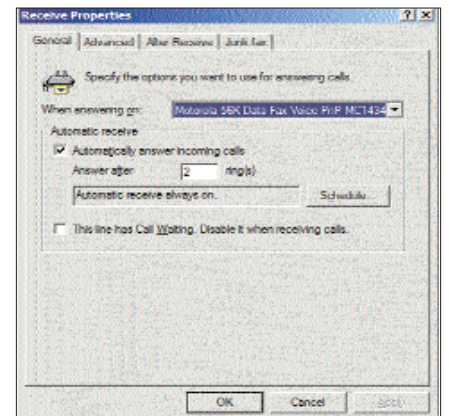
Once you complete the Configuration Wizard, the Fax Console opens up. The Incoming folder in the Fax Console contains faxes that are currently being received; the Inbox folder contains faxes that have been received; the Outbox folder contains faxes scheduled to be sent; the Sent Items folder holds faxes that have been sent successfully.

To create a new fax, click 'New Fax' on the toolbar, or go to *File > Send a Fax*. This will start the Send Fax Wizard. Click Next on the Welcome screen and enter the recipient's information such as name, fax number and click Add to add the entry to the recipient list. You can add multiple recipients and also build an address book.

Click Next, choose a template and enter the subject and note for the fax to prepare its cover note. Specify the fax's priority and when you want to send it in the next screen. The final screen shows you the fax summary and also gives you an option to preview it. Click Finish and *voila!* You have just sent your first fax.

What if you need to fax an MS Word document? Use the Fax printer that is installed along with Microsoft Fax. To fax a file from any application, go to *File > Print*, select the Fax printer in the Print dialog box and click OK. This starts the Send Fax wizard that lets you specify the receiver as discussed above.

Coming to the receiving part, if you have configured it to receive faxes automatically, then you don't need to do anything (remember the Fax Configuration Wizard?). Click the Receive Now button on the toolbar of the Fax Console, if you have configured it to receive the fax manually. Alternatively, activate the Fax Monitor by going to *Tools > Fax Monitor* and click Answer Now.



Schedule when you want to receive fax automatically

Network faxing

Though quite comprehensive, Microsoft Fax lacks features such as network faxing. You will need powerful software such as Symantec's WinFax PRO 10.0.

The setup is straightforward. Once it's complete, the first screen asks you to enter the CSID (called station identification), your fax number and your phone number. The second screen asks you to choose modems and other devices that you want WinFax PRO to use to send faxes. Next, the chosen modem is tested to determine speed and other parameters. Once this is done, specify whether you want to put WinFax PRO controller in the Windows Startup. You can receive faxes via e-mail by enabling that option in the next screen. All you need to do is choose the e-mail program and enter the password.

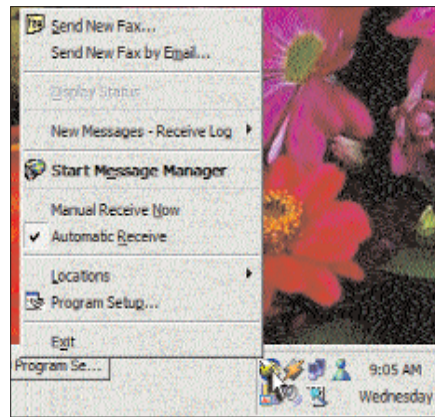
If you wish to skip the registration step, click on Cancel. Finally, the Live Update starts to update WinFax PRO—this can also be skipped by clicking on Cancel. That's it!

Sending a fax

Bring up the WinFax PRO Message Manager—the centre point for all of your fax related tasks—by going to *Start > Programs > Symantec WinFax PRO > WinFax PRO Message Manager*. Go to *Send > Send New Fax...*, or click Send on the toolbar to bring up the WinFax PRO dialog box. Here, click on an address book entry to insert the name and fax number, or enter them manually, and then click on Add to List. Also, schedule the send time for individual recipients by clicking on Schedule. Next, to create a cover page, choose '(Other...)' from the drop-down list that's located just below the subject field, to bring up the 'Select Cover page' dialog box. Choose from the many pre-defined templates here and add the note and the

subject that appears on the fax's cover page. Finally, click Send to send the fax.

You can view the status of the fax—whether it failed or was sent successfully—by clicking Send Log in the Message Manager. If you want to send a fax as an e-mail, click Send on the Message Manager window to bring up the Send dialog box. Here, click Email on the toolbar. A new dialog box opens where you specify the address of the fax recipient, the subject and the message. Next, click Insert to insert files and click on Send when you are done. This fax will be sent the next time you open your e-mail client. The advantage of sending a fax to e-mail is that your Word files, etc., can be viewed by anyone, even those who don't have Word installed, and secondly, it goes in an unalterable format. When you send fax to e-mail, it is sent as a self-executing file that can be viewed on any Windows PC.



Right-click the fax icon to access the most common functions of WinFax PRO

Receiving a fax

Check whether automated fax receiving is enabled by right-clicking the fax icon in your System Tray to show the controller menu.

If 'Automatic Receive' is enabled, faxes will be received automatically. If it is unchecked, you will have to right-click the System Tray fax icon, and click 'Manual Receive Now' or go to *Receive > Manual Receive Now* in the Message Manager window to receive the fax. You can customise the fax receiving settings even further by going to *Start > Programs > Symantec WinFax PRO > Program Setup > Receive* and then selecting Properties.

Setting up a Fax Server

WinFax PRO can be setup on a network in an organisation such that PCs send their fax jobs to one computer that acts as a fax server. This lets you use a single modem and a phone line. To set up the WinFax PRO server, run the setup and then go to *Start > Programs > Symantec WinFax PRO > Program Setup*. Click on Fax Sharing Host, select Properties and check 'Use this WinFax PRO station as a Fax Sharing Host'. You may also specify a password here, so that only authenticated users can access the fax server. Click OK, and then click Close.

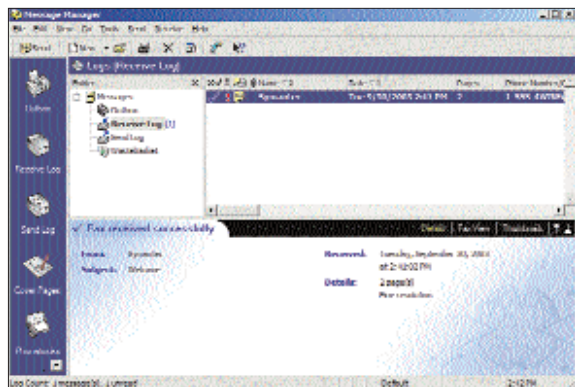
On the client PCs, when you come to the Modems And Communications Devices panel in the Configuration Wizard, click WinFax PRO Fax Sharing and click Next. Click Yes to configure the WinFax PRO Fax Sharing device. In the WinFax PRO Fax Sharing Client Properties dialog box, enter the name of the fax sharing server in the Host Name section. Enter the password, if it exists. The rest of the steps are similar to the normal installation. Now, when a fax is sent from the client machine, it goes to the server and is sent automatically.

Use the options in the General tab to specify the number of rings after which the call should be answered. Specify the time when you want calls to be answered automatically by clicking on Schedule. Decide the action that has to be taken after a fax is received, such as playing a sound or printing it in the 'After Receive' tab. In the 'Junk Fax' tab, you can specify what to do with junk faxes—faxes with a missing or incorrect CSID.

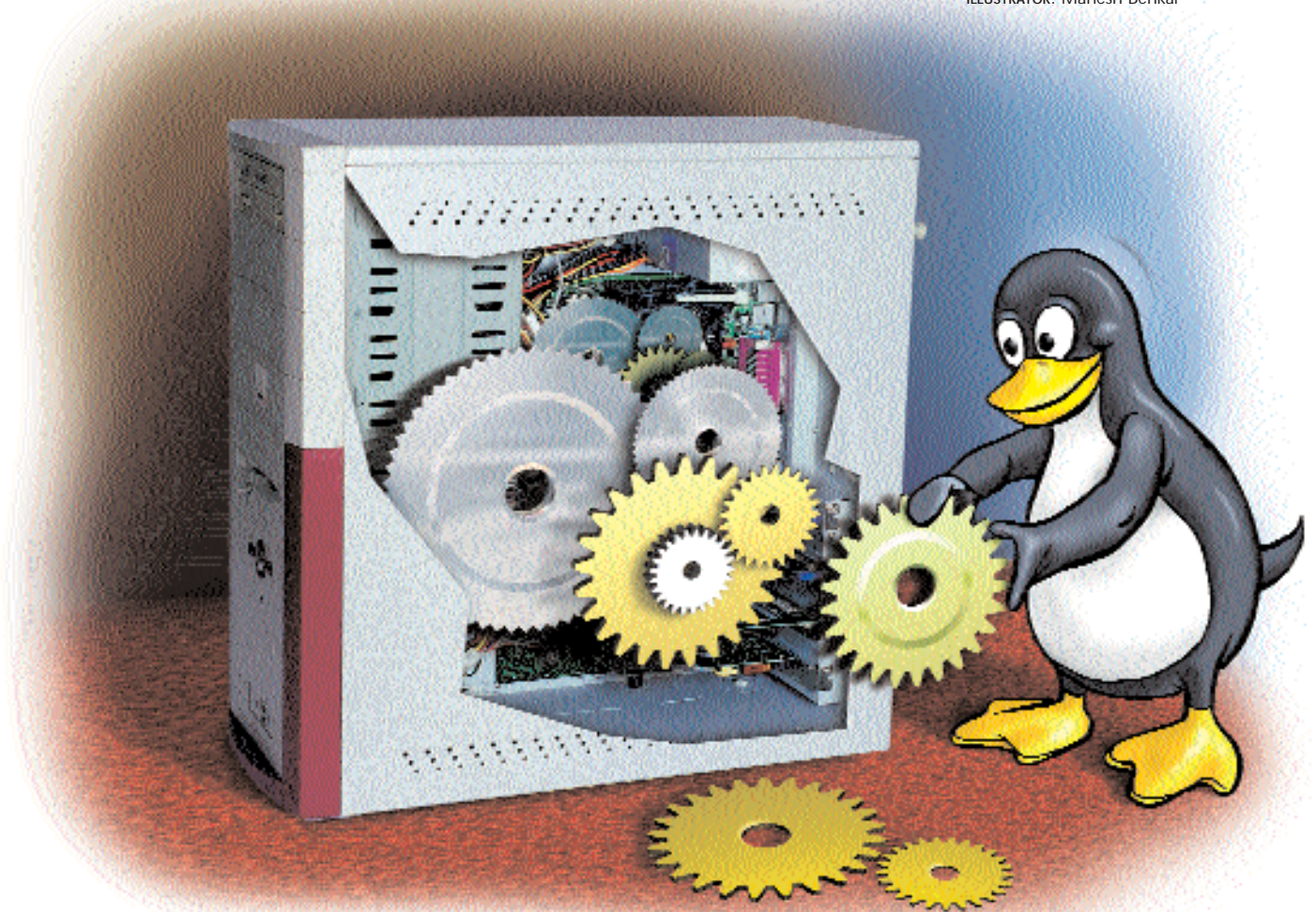
In fact, there are lots of features that can be customised in WinFax PRO. For this, you will have to go to the Program Setup located in the *Start > Programs > Symantec WinFax PRO* group. Here, you will find options such as backing up and restoring your faxes and logs.

That's the way you get your PC to double up as fax machine. You can also try setting it up using faxing software that comes with its modem driver installation CD. These software have made faxing very easy and less of a tedious job to do. So, the next time the boss needs to send things urgently, all you have to do is use the PC! ■

UPENDRA SINGHAI
upendra_singhai@thinkdigit.com



Message Manager is the control centre for all operation related to WinFax PRO



Tweaking the kernel

One of the best things about Linux is that you can chop and change anything and everything you want. the kernel—the heart of the OS—is no different, and we'll show you how to go about doing just that

Any Linux system is functionally organized at three levels: the kernel, which schedules tasks and manages storage; the shell, which connects and interprets users' commands, calls programs from memory, and executes them; and the tools and applications that offer additional functionality to the operating system.

One of the unique features of Linux is that the kernel source code is available for download, so users can compile the kernel to suit their requirements.

In this workshop we will compile and install a new version of the Linux kernel—we will keep all the other applications the same, and change just the core of the OS.

Why would anyone in his or her right mind decide to recompile the Linux kernel? There are several compelling reasons.

Imagine you've bought a brand new digital camera and it's not readily supported by your existing kernel. The vendor doesn't provide any loadable drivers, but there is support for the camera in a newer version of the kernel. If this happens, you'll have to upgrade your kernel.

Another scenario: you use a Linux desktop, and want to access NTFS partitions on Windows XP. You don't want to rely on the experimental stuff that came with your older kernel. The only alternative you have is to get hold of a new kernel with better support for NTFS, and compile it on your system.

In fact, the flexibility provided by the Linux kernel, in terms of recompilation, is one of the reasons for Linux being so widely adaptable to almost every imaginable platform and architecture.

One of the most detailed documentations available about the Linux kernel is right there in one of the kernel directories; you'll find a goldmine of information in the `/usr/src/linuxkernelversion/Documentation` directory. This directory contains individual text files for each and every file and module that is even remotely related to the kernel. While the majority of the stuff in these text files is quite techie, there's enough for the novice to get a fairly decent idea of what happens where in the kernel. But there is a small problem—this documentation is not one of those cute little html or chm files we are so used to seeing on Windows.

Installing the new kernel

To begin with, let's figure out what has and what hasn't changed in the Linux kernel. Earlier, the Linux kernel was a

monolithic structure. Everything was compiled into the kernel, and loaded into memory along with the kernel. Somewhere down the line, the kernel developers realised it would be better if some of the not-so-important stuff could be placed outside the kernel, and only loaded into memory when required. So along came modules, stuff that can be loaded by the user (or automated user level programs), as and when required. All the modules can be found in the `/lib/modules/kernelversion/` directory.

In this workshop, we will install the latest Linux kernel (2.6.0-test11) side-by-side your existing kernel (a stable 2.4.xx version).

STEP 1 Before installing the new kernel, you will have to check for the version numbers of a few software installed on your existing system.

First make sure that your `gcc` compiler version is 2.95.3 or higher. You can check this by using the `gcc --version` command.

Next, check the versions of `gtk+`, `glib` and `libglade`, using a combination of the `rpm` and `grep` commands:

```
rpm -qa | grep gtk+
rpm -qa | grep glib
rpm -qa | grep libglade
```

Look for output lines that say something like:

```
gtk+-1.2.10-11
glib-1.2.10-5
libglade-0.16-4, respectively.
```

Before going on to compile and install the 2.6.0-test11 kernel, make sure you have a distribution with a stable and working 2.4.xx release kernel. Upgrading from an older 2.2.XX series kernel to the 2.6.0 kernel is nearly impossible; you might as well install a new distribution rather than upgrade a few hundred packages.

STEP 2 Once you have checked all the prerequisites, you can go ahead and compile the new kernel. Download the latest 2.6.0-test11 kernel from www.kernel.org. Uncompress and untar this package into the `/usr/src/` directory. This is the directory where all kernel source code resides.

STEP 3 Next, `cd` to `/usr/src/linux-2.6.0-test11/` and type in the following command—`make mrproper`.

This command is not required during a first time install, but it is recommended to run it each time you recompile, since it removes any intermediate files generated during previous compilations.

STEP 4 The next step is to configure the new kernel to enable all the required

Patching the Linux Kernel

Patching the kernel is another approach to keep your kernel up-to-date. In this method, incremental patches are applied to the kernel, the advantage being that you don't have to download the complete kernel source code, just the updated patches. The downside is that you'll have to apply the patches regularly. These patches are available at www.kernel.org. Once downloaded, enter the top level directory of the kernel source (for example, `linux-2.6.xx`) and then

patch it using the following command:
`gzip -cd ../patch-2.6.xx.gz | patch -p1`
 or `bzip2 -dc ../patch-2.6.xx.bz2 | patch -p1`

Alternatively, you could use the 'patch-kernel' script found in the `scripts/` directory in any kernel source directory. The patch-kernel script must be passed a parameter that shows the location of the kernel source tree (for example, `/usr/src/linux-2.4.0`). It picks up the patch file from the current working directory.

options that you want included in the kernel. These configuration parameters are stored in a `.config` file in the kernel source directory, and can be switched on or off by directly editing the file. However, the contents of the file are cryptic, and various front-ends are available to configure the kernel. The simplest way is to type in '`make xconfig`'.

This will bring up a dialogue box that can be used to configure the parameters required for compiling the kernel.

In the new 2.6 kernels, there are multiple ways of configuring the kernel. Apart from the older `make config`, `make menuconfig` and `make xconfig` commands, there is a `make gconfig` command that brings up a gnome-based interface. Also to be noted is that now, `make xconfig` does not use a simple tk based interface; it is kde-based, and won't run unless the latest kde libraries are installed. The gnome-based interface also requires the latest gnome libraries, failing which it will not run. While this might be a source of irritation to die-hard Linux fans, it reflects a conscious decision on the part of the kernel developers, who came up with an interface that is easier to use for novice users.

To use `make gconfig` you will need `gtk+ 2.0`, `glib-2.0` and `libglade-2.0`. If these are not installed on your system, it would be better

to switch to a newer distribution, as upgrading these packages will be quite tedious. In any case, if you still need to upgrade, you could try the `make menuconfig` command that brings up a barebones interface on the console. If you've used a text-based install of Red Hat, you won't have any problems using this configuration utility.

STEP 5 Next, use the `make dep` command to build all the required dependencies:

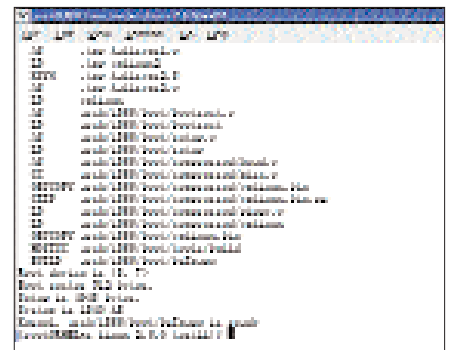
After this comes the main step—the creation of the new kernel image. For this, type in `make bzImage`

This creates a compressed image of the Linux kernel that is used for system booting. The compression is done using the `bzip` algorithm. In fact, 'bzImage' stands for 'big compressed image', and you can create a different version of the compressed image that is guaranteed to be smaller than 512 KB. If this step goes well, you will get a message saying that the image is ready.

STEP 6 The next step is to use the `make modules` command. This command is responsible for compiling all the modules that were configured at the start, and are now in the `.config` file. After compilation, the modules have to be installed in the



`make menuconfig` brings up a barebones interface that can be used to configure kernel parameters before compilation



The output of the `make bzImage` command gives the location of the compiled image, and some more detailed information

Kernel Secrets

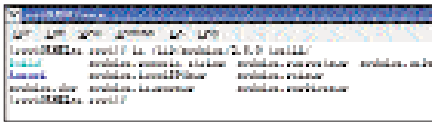
About 'make'

All throughout this workshop, and in many of the previous workshops, we keep bumping into this command called 'make', every time we have to compile and install any application. What exactly is make, and why do we keep appending it with words such as 'install', 'clean', etc.? The secret of all this lies in a single 'Makefile' that resides in the directory in which you are compiling the software. Typically, this is the main directory that is created once you untar a 'xxx.tar.gz' or 'xxx.tar.bz2' file using the `tar -zxvf` or `tar -jxvf` commands. This Makefile has all the directions that the make utility needs to compile and install the application. But all these instructions are not just executed in one single go. Instead, various groups of commands, called targets, are clubbed together in different sections of the Makefile. The word that is appended to make utility is, in fact, the name of the target group, and can be found in the Makefile.



`/lib/modules/version-number` directory, where 'version-number' should be replaced by the version number of the kernel being compiled (2.6.0-test11 in this case). This is done using the `make modules_install` command.

Check if all the modules were copied



All the new modules are installed in the `/lib/modules/2.6.0-test11` directory to the destination by typing `ls /lib/modules/version-number`

7 After configuring and recompiling the kernel, you need to copy it to the `/boot` directory along with your existing, stable kernel, and then let the boot loader know of the existence of this new kernel.

Copy the `bzImage` file to the `/boot` directory using the `cp /usr/src/linux-2.6.0-test11/arch/i386/boot/bzImage /boot/bzImage-2.6.0-test11` command.

Linux kernel development tree:

The kernel typically has two releases out at a time. One is the 'Stable' release—which is currently the 2.6.X series—and one is the 'Development' release, which is currently 2.5.X. Stable kernels are well tested and have passed through a great deal of quality assurance testing and bug fixes. Development kernels are experimental with a lot of new, untested code. These are not recommended for production machines. Most Linux distributions ship the latest stable kernel. The stable kernel is always an even number, say 2.2.XX or 2.4.XX. The development kernel is always an odd number, like 2.3.XX, or 2.5.XX.

Cross-compiling:

Linux is an operating system that has been ported to a multitude of platforms. Today, Linux runs on almost any architecture currently available. This has been of immense help to software developers, since the source code for their applications can be compiled on all these platforms with minimal trouble. This is possible because almost all the development tools have also been ported to the respective architectures. In particular, there's a feature in 'gcc' that lets developers cross-compile source code to

generate executable files that can be run on a platform other than the one on which it was compiled. What this means is that a simple application, let's say an mp3 player, that was cross-compiled using gcc on an Intel x86 pc to run on a PowerPC processor, can be just copied to the PPC machine and run as though it were compiled on it.

This cross-compiling is not just restricted to Linux applications, the Linux kernel can itself be cross-compiled to run on another platform. So using the same source code and the same compiler, you can create a new kernel image than can run on your Mac running Yellow Dog Linux.

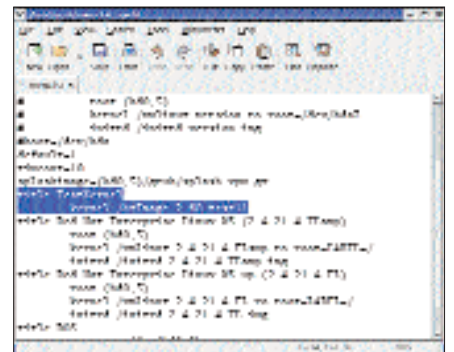
You don't necessarily have to compile the kernel just to install a new version of the kernel. You could use recompilation to switch on certain features in your existing kernel that were not enabled by the vendor—Red Hat, SuSE, etc. For example, if you just bought a Aironet wireless adapter, and want to configure it to run on Linux, chances are you won't have to scout the net to get a driver module; it will be right there in the kernel source tree. You can configure the driver to be either built into your kernel, or you can build it as a kernel module during the 'make xconfig' stage.

In LILO, you just have to update the `/etc/lilo.conf` file and type in `lilo` at the command prompt. If you are using GRUB as the bootloader, you will have to follow a slightly different approach. Use the 'grubby' command to add the newly created kernel to the GRUB boot menu as follows:

`grubby --add-kernel=/boot/bzImage-2.6.0-test11 --title=TestKernel`

This command will add a new entry to the GRUB boot menu file, `/boot/grub/menu.lst`. Make sure that the title parameter is passed to grubby, since this is the option that will be added to the boot menu that appears during bootup. Open the file in a text editor and check if the entry was added correctly.

That's it, we're almost done. Just reboot your machine, and select the TestKernel entry in the boot menu to boot into your new kernel. If everything went fine, you should not notice any difference between your previous GUI and the present one. To verify that the newer kernel is being used, use the



The 'grubby' command will add an entry for the new kernel in the menu.lst file

`uname -r` command.

But this is just the beginning; once you start using the new kernel, you will be faced with a number of problems and will have to work on these. But the added advantages you get out of using one of these bleeding-edge kernels outweigh the trouble involved in installing a new one.

PRAVEEN KURUP
praveen_kurup@thinkdigit.com



Here are the remedies for Knoppix headaches, faltering game frames, nasty bootups, nastier errors and cellular annoyances...

Linux not booting from disk

While re-installing Windows 98 SE on my PC that also runs Red Hat Linux 9.0, I received a warning about modifying the boot sector. Upon restarting, I found the LiLo boot menu missing. I tried the solution given in one of your earlier issues to a similar problem, but Linux would not boot from my boot disk. SOS!

Nikhil

Use the loadlin program to boot into Linux from DOS mode. loadlin is located in the dosutils directory on the Red Hat 9 Installation CD. Copy loadlin and vmlinuz—the Red Hat 9 image file—located under the autoboot directory onto your Windows partition. Restart in DOS mode, and type `loadlin C:\vmlinuz root=/dev/hdXX` at the command prompt. Replace XX in hdXX with the location of the Linux root (/) partition, e.g. hda1. This will boot you into Linux. Modify the `/etc/lilo.conf` file to reflect Windows by adding the following entries to the end of the file:

```
other=/dev/hda1
optional
label=Windows
```

Here, change 'hda1' to your Windows drive. Now, type 'lilo' at the command prompt to place the Linux loader in the MBR.

Red Hat not playing MP3s

I am unable to play MP3 files ever since I installed Red Hat Linux 9. I downloaded

and installed the latest xmms (1.2.8) from www.xmms.org, but MP3s just won't play. The progress bar moves quickly and the speakers emit nothing! My sound card is configured properly, since I can play audio CDs.

I don't know how to play VCDs either. I am unable to find software that plays .dat files.

My PC is a Pentium IV 1.5 GHz that has 128 MB RAM, an 845 motherboard and an AC97 onboard sound card.

Ashish Mehta

Unfortunately Ashish, Red Hat 9 does not support MP3s anymore since the codec is no longer free. However, there are a few workarounds. One is to use the encoder library from an older Linux installation. Copy libmpeg123.so located in `/usr/lib/xmms/Input/` from a PC running Red Hat 7.3 or older, to the same location on your PC. Else, download the source rpm for an older version of xmms, preferably xmms-1.2.7-2.i386, from <http://www.megaloman.com/~hany/RPM/libmpeg123.so.html>. Next, run the `rpm -ivh xmms-1.2.7-2.src.rpm` command. Replace `xmms-1.2.7-2.src.rpm` with the name of the downloaded file. This installs the source code in `usr/src/redhat/SOURCES/`. 'cd' (change to a directory) to this directory and unzip the xmms file with extension .tar.bz2, using the bunzip2 filename.

This replaces the .tar.bz2 file with a

new .tar file. Uncompress it using `tar xvf filename.tar`.

This creates a new directory containing the xmms source code. 'cd' to this directory that has the name of the tar file and type `./configure`. Next, 'cd' to the sub-directory named 'Input', and type the following commands one after the other:

```
make
make install
```

This compiles the MP3 libraries and installs them in `/usr/lib/xmms/Input`. You should be able to play MP3s after this.

Check if the library is installed properly. Open XMMS, right-click on the main



Open XMMS and right-click on the main window to access Visualization.

window, and go to `Visualization > Visualization plug-ins`, or use the shortcut `[Ctrl] + [V]`. Click on the Audio I/O Plugins tab and check if MPEG Layer 1/2/3 Player 1.2.7 [libmpeg123.so] is listed and enabled in Input Plugins.

As for playing .dat files, use mplayer, which you can download from www.mplayerhq.hu.



Fatal error with .exe

Q. I developed a software application in Visual Basic 6.0 with Oracle as a back-end and Windows 2000 Server. I receive a fatal error when I try to execute the .exe file of the application in Windows 98 or 95. However, it runs fine in Windows XP. Can you help me find a solution to this?

Silishi M

A. Check whether the program generates errors after installing Visual Basic 6.0 on a Windows 98 PC. If it does not, then you need to install the Visual Basic Runtime Setup, downloaded from www.microsoft.com, on the Windows 98 and 95 machines that execute your program.

Setup goofups

Q. I have a P4 1.6 GHz, nVidia Riva TNT2, 128 MB RAM and a 40 GB hard disk running Windows XP Home. DirectX 9.0b is installed. I had initiated the setup for an application that automatically downloads

files from the server. However, I cancelled that and installed it later from an offline setup pack. Now, whenever Windows starts up, it prompts me to connect to the Internet. On clicking Cancel, it indicates that the auto setup failed and a complete setup icon is placed on my desktop.

Also, while playing *The Hulk*, I get a DirectX error even before the main menu loads.

Shitanshu

A. You have described the problem too vaguely for us to determine the cause of the Internet connection error message. Assuming that the auto setup you're referring to is the Windows Update Web site, you could try turning off Auto Update to resolve it. To do this, go to *Control Panel > System* and click on 'Automatic Updates', and uncheck the 'Keep my computer up to date' box.

Your system does not meet the minimum requirements of *The Hulk*. You need a graphics card such as the ones from

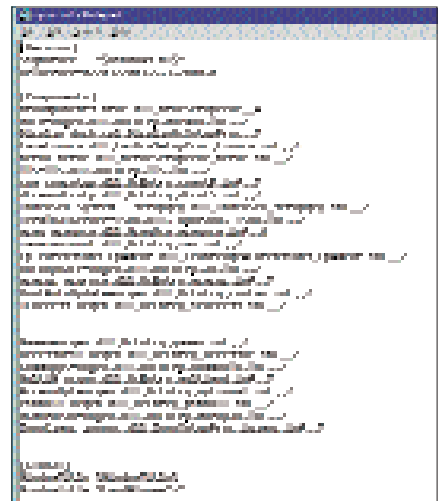
GeForce2 that supports hardware transform and lightning, and 256 MB of RAM, to play the game smoothly.

Deleting games

Q. How do I delete the default games that come with Windows 2000 Professional?

Vibhor Mangla

A. Use Notepad to open the Sysoc.inf file that's located in *c:\winnt\inf\sysoc.inf*. Remove 'HIDE' from the line '*Games=ocgen.dll,OcEntry,games.inf,HIDE,7*' and '*AccessUtil=ocgen.dll,OcEntry,accessor.inf,HIDE,7*', and save the file.



When you open the file in Notepad, it will look as shown. To enable/uninstall for a particular program, just remove the word 'HIDE' without disturbing the rest of the file

Next, go to *Add/Remove Programs > Windows Setup > Accessories and Utilities*, de-select the Games option and click Apply.

Not smooth with games

Q. I have an AMD Athlon XP 2400+ on an MSI KM266 chipset-based board with 256 MB DDR RAM and a GeForce2 MX graphics card. My PC does not run smoothly when playing *Quake III Arena*. It also takes a lot more time to load Windows 98 SE than my older PIII 1.0 GHz with 128 MB SDRAM and an 810E chipset. Another problem is that my processor heats up to over 53 degrees and often crosses 56 degrees when playing games.

Dhananjay Kulkarni

A. Jerky game frames could be due to various reasons—application conflicts, dated drivers, etc. Close all background applications, especially virus scanners, while playing games. No other program

Bits or bytes?

Q. I bought a data cable for my Nokia 7250 to connect to the Net, but it turned out to be a serial cable. I cannot use the Nokia software since it works either using infra-red or the DKU 5 USB data cable. Some third-party software allow for transfer of files, but I cannot access the Internet. Is there a way to make this serial cable work? Are there any USB converters that I can use? Will they work? And lastly, will the Internet speed be better than dial-up? It takes me 20 to 30 seconds to download a ring tone of 7 KB - 10 KB on my phone.

Ishaan

A. The cable you purchased is a DKU-3 cable that provides serial connectivity, while the DKU-5 cable provides USB connectivity. That is the only difference. Once the mobile is connected to the PC, it appears as a modem. You can then use any dialer, including the Windows dial-up connection, to connect to the Internet.

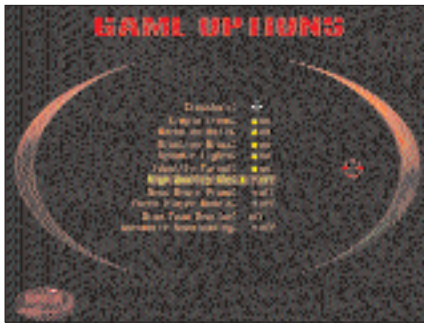
As for the speed of the GPRS, it is 4.0 KBps. The difference between Kbps and KBps is that b indicates kilo 'bits' per second, while B indicates kilo 'bytes' per

second. A byte is made up of 8 bits and requires a few error or parity bits. Hence, a single byte of data uses at least 10 to 12 bits. Thus if the bandwidth is 43 Kbps, then, in terms of bytes, it is 4 KBps. It should provide 4 KBps bandwidth, but as a general observation, speeds of more than 2 KBps are not available. Hence the Net speed is far inferior to the dial-up speed. The newer GSM phones support Enhanced Data rates for Global Evolution (EDGE) that gives you download rates of 21 KBps.



ILLUSTRATOR: Mahesh Benkar

Finally, you can use Nokia PC Suite on your mobile since it does not depend on the type of connectivity used. You may also like to try Oxygen manager software (www.oxygensoftware.com) that has most of the features of Nokia PC Suite.



To reach Game Options, you need to click on setup and then Game Options after starting Quake III

should be running when you play Quake III.

Update your graphics drivers to provide a boost in performance.

Decrease the game resolution in Quake III by going to Setup > System > Graphics. Next, just leave the Simple items options enabled in the Game Options menu and turn off the rest.

Your OS could be taking a longer time to load due to the presence of several Startup items, a large number of fonts, fragmented files, etc. Uninstall unnecessary applications, and run Scandisk and Disk Defragmenter to speed up disk access. As for the CPU temperature, 53 to 56 degrees is quite normal for the AMD. Just make sure you have a good quality fan to dissipate the heat.

Knoppix headaches

Q I have a Compaq PC that has a Pentium III 733 MHz and 64 MB RAM. I use a Knoppix CD to run my system. Booting from that CD is very slow. Can I install Knoppix on the hard disk and boot from it instead? If yes, let me know the steps to do so.

Narender Kumar Kalra

A Narender, don't expect a Knoppix CD to boot at the speed of lightning on a PC with 64 MB RAM! You need to have at least 128 MB for a speedy bootup.

Here's how you install it onto your hard disk. Boot via the Knoppix CD and wait till the OS is loaded completely. Press [Ctrl]+[Alt]+[F1] to reach the console. Type 'knx-hdinstall' and press [Enter]. Follow the installation wizard till it reboots.

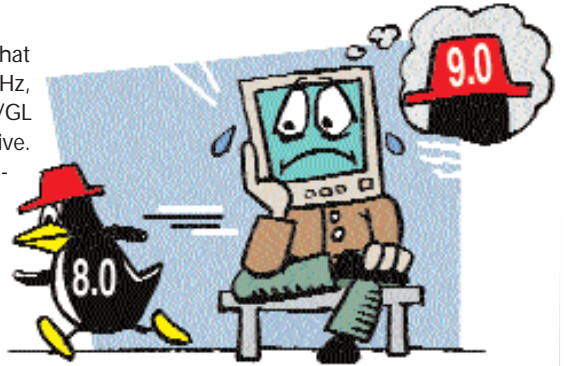
If the language is not set properly, go to Control Center > Personliche Einstellungen > Land und Sprache. Here, choose 'locale and language' as 'English'. Click Andwenden and restart the Control Center to get the change effected.

An incompatible chipset

Q I have an HCL BusyBee that comprises a Pentium 4 1.7 GHz, 128 MB SDRAM, Intel 845G/GL chipset and a 40 GB hard drive. The sound card did not get configured when I installed Linux Red Hat 8.0. According to my system administrator, the 845G/GL chipset does not support version 8.0. Do I upgrade to a higher version? Also, can I use Windows XP along with Red Hat 9.0 without any hiccups?

Dipti Ranjan Nayak

A You can use Red Hat 9.0 along with any version of Windows. Sound drivers



for 845G/GL motherboards are included in Red Hat 9.0. However, if you want to use Red Hat 8.0, download the necessary drivers from www.linux-drivers.org.

You may also refer to the extensive documentation available at <http://www.freenet.org.nz/misc/knoppix-install.html> and <http://librenix.com/?inode=3250> to install Knoppix.

Too much memory is too less

Q I have a Pentium IV 1.8 GHz, a 40 GB hard disk, 128 MB DDRAM and an nVidia graphics card running Windows 98 and Windows 2000 Server. I have VB.Net installed in Windows 2000. I get a message that says, "Your Computer Virtual Memory is too low" when trying to load VB.Net applications. The partitions on my disk are as follows C: has 10 GB, D: has 20 GB, on which I installed VB.Net, E: has 5 GB and F: has 5 GB. The minimum paging file size is shown as 192 MB, and maximum is shown as 384 MB under D:. The other fields are kept vacant. Can I use this option to increase the virtual memory setting? What is the maximum level that I can set it to? Will it affect the normal working of the system? Will it load the VB.Net project files without any problem? Currently, the system slows down when doing so. Help!

Another problem is the execution of the project file in VB.Net. I created a shortcut for the .exe file on the desktop and executed the same without any problem in Windows 2000. However, when I copy it to Windows 98 and try executing it, I get a message saying that mscoree.dll is not found. Where can I get this file and where do I copy it to? The .Net project uses an MS Access database that is available under both OSes.

Venu Gopal S

A You can increase the size of virtual memory page file manually. The maximum value that it can be set to is the amount of free space on the drive. You can even allot space on more than one drive for the page file. However, before you look at increasing the size of the page file, try to reduce the number of running applications, and stop all unnecessary services, including IIS. Virtual memory page files are very slow to access. Ideally, you need to have at least 256 MB of RAM to use VB.Net.

Programs written in VB 5.0 or VB 6.0 need the VB Runtime files to be present on the computer that they are running on. Similarly, applications written in any .Net language require the .Net Runtime to be installed. The Runtime files are about 20 MB, and are present on the VB.Net installer CDs.

Changing shut down message

Q I have a Pentium III 600 MHz, a 10.2 GB hard drive, 64 MB RAM and an ATi card running Windows 98 SE. How do I change the default shutdown message?

Gurpreet Singh

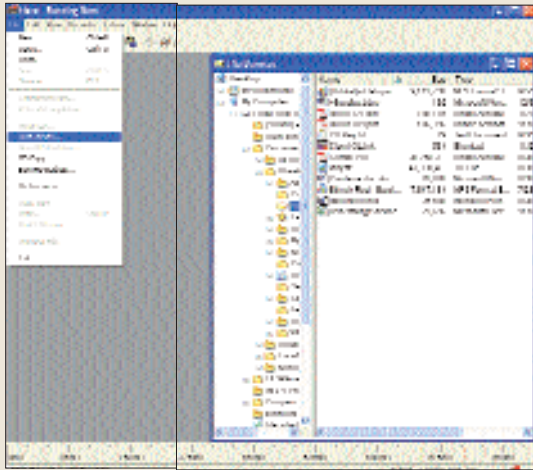
A That's simple! Open C:\Windows\logos.sys in MSPaint, modify the message in the .bmp file and save it. Shut down the PC to see the new message. As a precautionary measure, back up the original file. You may also use any picture available in the .bmp format as a shutdown screen.

FAQs

Boot failure

Q, I have a Pentium III. Using the steps given in the magazine, I burnt the Red Hat 9 ISO images present on the Linux DVD, onto three CDs, and changed the BIOS settings. However, I get a message indicating boot failure at startup. Is there any method to make these CDs bootable? Also, is it necessary that they be bootable?

Prasann Vyankatesh Nadgauda



Once you start Nero, click on File, then on Burn Image and finally the image to burn

A The CDs have to be bootable. The CD-Writer may not have burnt the images properly. Open Nero and go to

File > Burn Image. Select the ISO file and press Open. Next, click Write to burn the image.

Memory dilemmas

Q, I own a PC with a Pentium 4 1.4 GHz, an Intel 850 chipset and 128 MB of RDRAM. I want to upgrade my memory to 256 MB and make use of a graphics card. A hardware vendor told me to purchase a single 128 MB memory stick, while another said that I need two 64 MB sticks. I have two free slots on my motherboard and two 64 MB RAM sticks already on the board. How do I go about doing this?

Raj

A RDRAM modules need to be installed in pairs. This means that either you install two 128 MB sticks, or four 64 MB sticks. Since you already have two 64 MB modules, the cheapest option would be to buy and install another two of the same capacity. Ask the retailer to fit the modules onto your motherboard.

Backing up Norton

Q, I have an Intel Celeron 1.10 GHz, 160 MB RAM and a 40 GB hard drive, running Windows XP.

I updated the virus definitions for Norton Anti-Virus, but lost them all when I formatted the system. How do I backup virus definitions and restore them after formatting and installing Windows afresh?

Giri Giri

A All virus definitions reside in *C:\Program Files\Common Files\Symantec Shared\VirusDefs*. Copy them onto a CD or a floppy disk before formatting, and then copy them back to the same location. Alternatively, download the standalone .exe file from *www.symantec.com*, and double-click it to update the virus definitions.

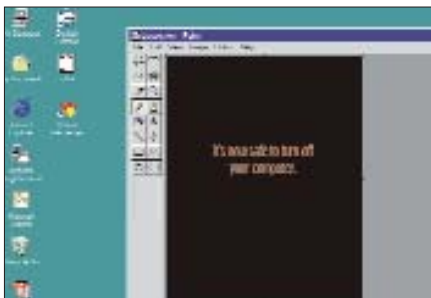


Take a backup of the virus definitions before you format your hard drive

tec.com, and double-click it to update the virus definitions.

An error unknown...

Q, I have a PC that comprises a Pentium 4 1.7 GHz, a VIA motherboard and a 120 GB hard drive running Windows XP SP1. I installed a GeForce 4 440 MX graphics card and 256 SD RAM to play *Age of Mythology*. However, a message stating that an unknown error has occurred appears while playing *Age of Mythology*, and the game quits. The error also comes



Modify the logo.sys file to change the shutdown message

up while playing *Command & Conquer*. Downloading drivers from the Internet did not help. I even replaced the graphics card with the GeForce 4 440 MX SE, but the problem persisted.

Prasananchandra Lakhani

A The reasons for the error can be many. There could be a problem with your drivers, or with DirectX. Update all the hardware drivers, and then update to DirectX 9.0b. Visit *www.viaarena.com* to download the latest 4-in-1 Hyperion drivers for the VIA motherboard. Also, update your sound drivers.

Reason number two can be insufficient power. This can happen if you possess a high-end video card, but a weak power supply. A supply of 300W would eliminate this problem.

Run a check on all the fans installed in your system to make sure they're running at full speed. Play with the system case

open to ensure the best ventilation. Reinstall the games after updating the drivers to replace any files that may have been corrupted.

Enter the BIOS by pressing [DEL] or [F2] at bootup. Here, in the Advanced Chipset Features menu, set the AGP aperture size to the lowest value, typically 4 MB. Next, reduce the AGP bus speed to 2X. Also, disable the Enable 4X AGP setting. AGP 4X needs more bandwidth and hence, more resources than AGP 2X. As a last resort, check for a BIOS update on the manufacturer's Web site.



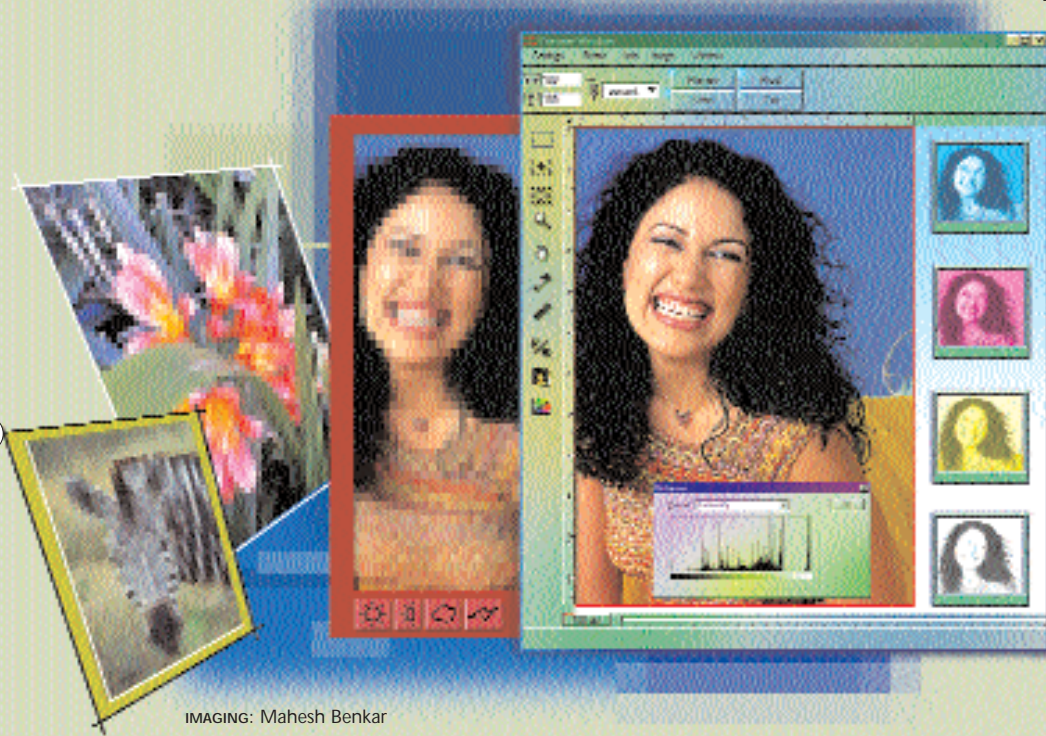
sos@jasubhai.com

E-mail us your computing problems, and we may answer them here! Since we get more mails per day than we can handle, it may take some time for your query to be answered. Rest assured, we are listening!

tips & tricks

Photo Finish!

Click those cho-chweet moments, scan that Swiss landscape, and doll it up...with aplomb!



IMAGING: Mahesh Benkar

contents

- 2 Digital Photography
- 4 Scanning
- 6 Processing

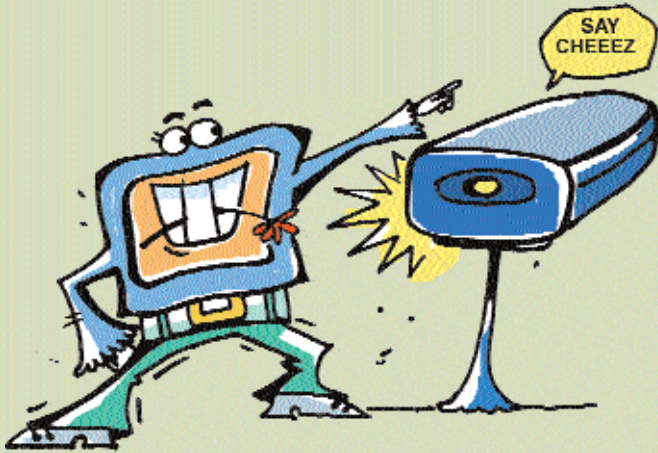


The Number One
Technology Destination

www.zdnetindia.com

DIGITAL PHOTOGRAPHY

Use these tips to breeze through a photo shoot using a digital camera!



2

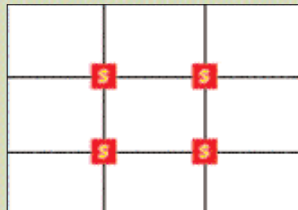
Focusing

You might face this problem if you use an auto-focus camera—the camera captures the distant background and blurs the subject. This is because cameras are usually designed to have a central focus. The solution is quite simple. Point the camera at the subject and position it in the centre of the frame. Keep the shutter button pressed halfway down to lock the focus on the subject and re-position the camera so the scene is framed to your liking. Finally, press the shutter button down completely to take a snapshot.

The Rule of Thirds

One of the most popular rules of photography, it applies to both traditional, as well as digital photography. According to this rule, if the frame of the viewfinder were to be divided into thirds, both hor-

izontally and vertically, then the four intersections are the best places to put your subject, instead of the centre of the frame. This yields an



Follow the Rule of Thirds to click appealing photos

appealing image.

In case of a landscape shoot that needs an emphasis on the sky, get the horizon on the lower horizontal grid.

Foreground and background

Zoom in and choose a large aperture setting for sharper foregrounds and blurred backgrounds. This setting is

appropriate for portrait photos. Zooming out and choosing a small aperture results in an equal focus on the background and foreground.

Shooting fireworks

Snap up those beautiful fireworks using a digital camera with a shutter speed longer than 1/2 a second. Ideally, opt for a shutter speed between 2 to 10 seconds to capture all the sparkle and razzmatazz. You will also need a tripod to avoid jerky, haphazard photos. Eliminate even the slightest possibility of vibration by using a camera that comes equipped with a remote shutter release.

Set ISO to the lowest setting to reduce noise—the tiny dots across such snaps. Enable long exposure noise reduction, if the camera comes with it.

Preview the shot on the LCD screen, and accordingly adjust the aperture so that it's just the right size to get bright sharp photos. Keep spare batteries with you.

Warm tones

Normally, the default white balance setting for most digital cameras is set to 'Auto'. Though this is fine in most cases, sunny landscapes and portraits taken in bright light could turn out dull. Hence, change its setting to 'Cloudy' to get warmer reds and yellows that make the picture look better.

Polarising filter

Polarising filter is used for outdoor shoots since it

reduces glare and reflection, and results in more saturated colours, especially in the case of sky. Use your sunglasses in case your camera doesn't have support for one. Place the glasses as close to the camera as possible, check the LCD to see that its frame does not obstruct the view and shoot. For better results, use it when the light source and the subject are at right angles, i.e., when the sun is exactly over your head. Further, set the white balance to 'Cloudy' for warmer photos.

Flash modes

Normally, digital cameras have three flash modes—Auto Flash, Fill Flash and Red Eye Reduction.

Auto Flash mode is used for general photography. In this mode, the flash determines whether it needs to be fired or not, based on the amount of light present. This mode is represented on the LCD by a lightning icon with a capital 'A'.

In the case of Fill Flash, the flash is always fired. This is useful when the subject is sitting in the shade with bright sunlight around. If set to Auto, the flash would not have fired, resulting in dark spots around the eyes. In the Red-Eye Reduction mode, the flash is fired several times before the shutter actually opens. Thus, the eye-pupils are contracted and the red-eye effect reduces. Use this mode when there is very little light and the photo depends on the flash.

ZDNet India
Where Technology takes you

Tips & Tricks, Software shortcuts, Q&A know-how,
How to guides, Step-by-step tutorials, Beginner guides

Help

www.zdnetindia.com/help

Snapping water

A camera with a shutter speed that's slower than a second or two can be used to shoot flowing water and make it look like a painting. Set your camera on a tripod. Adjust the aperture either to f-8, f-11, or f-16 for better depth of field. Now, set the shutter speed to 2 seconds, and shoot. Since you are using long exposures, make sure that the subject is positioned in the shade. Use polarising filters to enhance the effect.

Master the modes

Digital cameras have many presets, called modes or macros that let you click photos differently. Some of the common modes are Auto, Portrait, Landscape, Sports and Night. Auto mode is the general picture-taking mode. When you use this mode, the exposure, focus, and flash are set automatically. When this mode is active, there is usually a small camera icon on your LCD to indicate it. Portrait mode, usually shown on the LCD as a face, sharpens the subject and leaves the background out of focus.

Landscape mode is indicated by mountains on the LCD, and is suited for shooting subjects that are at a distance. Often, a slower shutter speed is chosen and hence, it's better to use a tripod while using this mode. The Sports or Action mode provides a faster shutter speed and is used to shoot fast moving objects. Night mode, as the name suggests, is used to shoot in poor light condi-

tions. Since this also means longer exposures, use of a tripod is recommended.

Taking silhouettes

Silhouettes make for appealing photographs. To shoot a silhouette, first position yourself with the sun somewhere in front of you. Now, set the exposure on the brighter part of the scene. Use the exposure lock button to secure the exposure. Re-compose the photo and shoot. If it doesn't have an exposure lock button, set the exposure compensation to -2 or -3.

Slideshows and screen-savers

To view your pictures as a slide show in Windows XP, open the images folder in Windows Explorer and click



Use Windows XP's 'My Pictures Screen Saver' option to view your photos as a screensaver

on 'View as slide show' under Picture Tasks in the Common Tasks area. Alternatively, right-click any image, select *Open With > Windows Picture and Fax Viewer*. Once the image is opened, press [F11] to start the slide show. You can also view this slide show

as a screensaver. Right-click the desktop, select Properties and choose 'My Picture Slideshow' in the Screen Saver tab. Click on Settings to specify the folder and other settings.

In case you use Windows 98, or intend to create a screensaver file, use utilities such as Irfanview (www.irfanview.com). In Irfanview, click *File > Slideshow*, specify the folder and other settings, and click on 'Save as .scr'. Save this file in *C:\Windows\System* in Windows 98, or *C:\Windows\System32*, if you use Windows XP.

Transferring pictures

There are two ways to transfer images from a digital camera to a computer. One is tethering, wherein the camera is directly connected to a PC using the cable provided with it. This can be slow and cumbersome and drains the camera's batteries, unless it has an AC adapter. The other way is to use a CardReader. Simply insert the memory card of the camera into the reader, and connect the reader to the PC. Most readers don't require separate drivers and support all major card formats.

Download pictures automatically

You can configure your digital camera in Windows XP to download pictures automatically when it's plugged in. However, the camera should either have the Windows Image Acquisition driver, or support Picture Transfer Protocol (PTP). Right-click the

camera icon in My Computer, and choose Properties. Go to the Events tab, click 'Save all pictures to this folder' and specify the folder. Now, whenever you connect your camera, the pictures will be automatically downloaded to that folder.

Care and maintenance

Carry your camera and other accessories such as memory cards, batteries, cleaning kit and tripod in a separate bag. Keep your camera covered with a plastic bag to protect it from moisture. Also, place some silica gel bags along with it to absorb moisture.

Never use paper tissue or napkins to clean lenses. They contain scratchy wood products and may damage the coating on the lens. Use a camera-cleaning kit that includes special brushes and a lens-cleaning solution. Keep the bristles of the lens-cleaning brush from coming in contact with your hands as body oil gets transferred onto them. After cleaning with a brush, put a drop of lens-cleaning solution on a lens-cleaning tissue, and clean the lens in circular motions.

Avoid high temperatures as these affect the camera. When in bright sunny light, keep the camera covered in a white towel when not in use. Keep the camera away from strong magnetic fields, as it may damage its memory card. Finally, remove the batteries and store them in a dry cool place if you do not plan to use the camera for a few weeks.

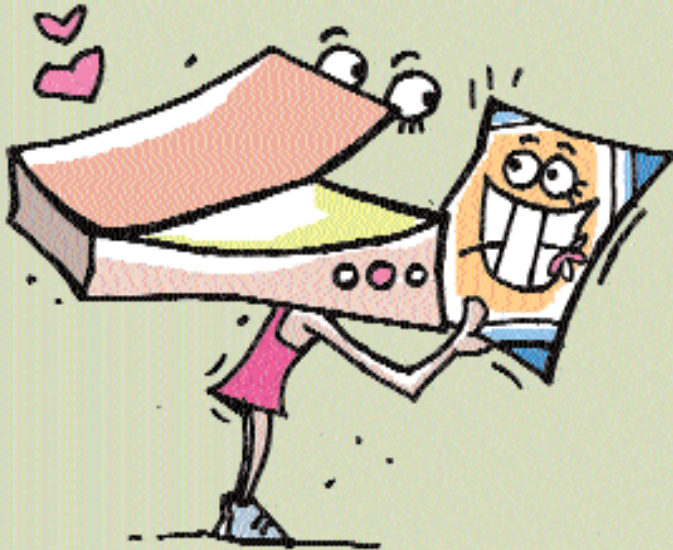
Virus Alerts, Bug Fixes, Patches, Security

Virus Workshop

www.zdnetindia.com/virus

SCANNING

A scan lets you get that lovely little picture onto your desktop. Using these nifty tricks while you are at it!



■ Buying a scanner

Before buying a scanner, you need to keep your budget in mind and evaluate the scanner on the following points: Resolution, measured in dots per inch (dpi), determines the sharpness of the scan. Typical flatbed scanners offer a resolution ranging from 600 to 2400 dpi. The second factor is Dynamic Range. Scanners that reproduce white perfectly have a minimal optical density or Dmin of 0.0. On the other hand, scanners that output a perfect black have a maximum optical density or Dmax of 4.0. These two values constitute the dynamic range of the scanner. Typical values for these are 2.5 and 3.5.

Another factor is the Bit Depth. This is concerned with the analog to digital conversion of images, during scanning. Typically, scanners have 48-bit conversions, with 16-bit each for red, blue and green. The next feature that you should consider is the speed of scanning. Though there is no standard method of measuring the speed, you can compare the time taken to scan the same image at the same settings by different scanners.

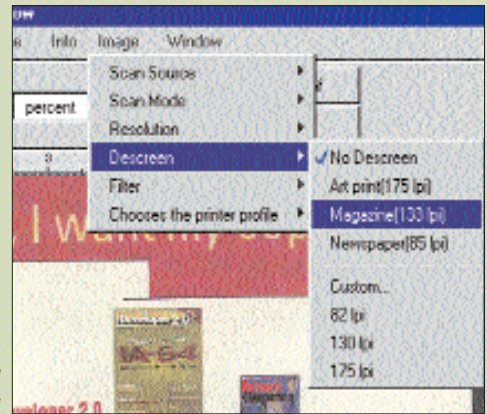
Finally, look for transparency adapters for scanning slides and negatives, Automated Document Feeders (ADF), etc. If you are looking for any of these features, make sure that you

buy a model which come with these accessories, as buying them separately is expensive.

■ Calibrating the scanner

Calibrate your scanner every one or two months for optimum results. Calibration involves scanning a known colour and adjusting the output to match that colour. In case the scanner doesn't support calibration, get a standard gray (RGB=128,

128, 128) reference colour card from a photo lab, and scan the image along with it. Open it in Photoshop and press [I] to activate the Eyedropper tool. The Info Palette shows the RGB values as you move the mouse pointer over the colour card. If it matches with the actual colour (RGB = 128, 128, 128 in this case), your image colours are perfect. Otherwise, change the colour balance and brightness of the



Use Descreen filter when scanning printed material

Calculating image size and PPI

Use this table to calculate the scan dpi, depending on the print resolution and printed size desired:

Printer Type	Standard inkjet printer	High-quality inkjet printer	Photo-quality inkjet printer
Print Resolution	300 to 320 dpi	600 to 720 dpi	1,200 to 2,880 dpi
Scan Resolution	150 ppi	150 to 240 ppi	240 to 360 ppi
Printed Size	Actual Pixel Dimensions (Average)		
2 x 3-inch	300 x 450 pixels	400 x 600 pixels	600 x 900 pixels
4 x 6-inch	600 x 900 pixels	800 x 1,200 pixels	1,200 x 1,800 pixels
5 x 7-inch	750 x 1,050 pixels	1,000 x 1,400 pixels	1,500 x 2,100 pixels
8 x 10-inch	1,200 x 1,500 pixels	1,600 x 2,000 pixels	2,400 x 3,000 pixels



Interactive Mobile Finder, Mobile Comparison, Reviews
Buyers Guide, SMS Special, Prices

Mobile

www.zdnetindia.com/mobile



Use the Lineart mode in the scanner software to scan line-arts

image until you get the precise reference colour. Finally, crop out the scanned reference colour card.

Scanning magazines

Scans of magazines or newspapers often result in dotted image patterns, commonly referred to as moiré. Minimise this effect by scanning the image at 300 dpi with the scanner software's Descreen filter on, and then re-sizing it to 33 per cent of its size using photo-editing software such as Photoshop. Finally, apply the Unsharp Mask filter.

Scanning line-art

Line-art is a clip art, drawing or pencil sketch, consisting of two colours. There are three methods of scanning line-art. The first is the Black and White Mode, or 1-bit scanning that just picks up the black areas. This method suits line-art that does not have shades akin to that of pencil sketches as it keeps the

image size to the minimum. Remember to re-size and rotate at the time of scanning, to preserve the final image quality.

The other method is the grayscale mode, or 8-bit scanning that records shades of grey. This results in much larger files, but it's suitable for line-art with shades.

The third method—halftone—is a format that prints black dots in a manner that simulates shades of grey.

Scanning for fax

Scanning at 200 dpi in Line Art mode, 100 per cent is most suitable when the image has to be faxed. The easiest method would be to print the image to the fax driver directly from your scanner program. Fax always uses the Line Art mode—even if you scan it in some other mode, the fax software converts it into Line Art.

Scanning oversized images

If the image to be scanned is larger than your scanner glass, but its longest side is

smaller than the double the longest side of your scanner's glass, you can follow this method:

Make a mark after every eight inches on the longest side of the image from the right to the left. Now, rotate the image by 180 degrees and mark it in the same manner, on the opposite longest side. Here, we assume that the image has a landscape orientation, i.e., its width is greater than its height. Now, align the upper-right corner of the image with that of the scanner glass. Choose the settings at which you want to scan the whole image and start the scan. Save this file as Image1.tif. Move the image to the next mark and scan without altering the settings. Save this file as image2.tif. Repeat the process till you have scanned the entire image. To scan the lower half of the image, turn the painting by 180° and repeat the above process. This time use a different naming convention

like lower1.tif, lower2.tif. This is necessary because we will have to flip these lower images before creating the final image.

Open all the images in Photoshop. Create layers for each image by clicking *Layer > New > Layer from Background*. Rotate the canvas by clicking *Image > Rotate Canvas > 180°* for all the lower-half images. Create a new blank image, large enough to accommodate all these images. Put all the layers on this image and align them appropriately to get the final picture. You can also use Photoshop CS's (Creative Suite) Photomerge feature to automate the last step.

Saving scanned images

Save images scanned to be used on the Web or be sent as e-mail attachments in the .JPEG format. .GIF is a better option for images such as line arts that have less than 256 colours since it results in smaller file sizes.

If you plan to edit the images later, save them in an uncompressed format. You may also save them in the TIF format as it allows compressing without causing loss of image quality. If you are scanning images for archival, it's always recommended that you save one copy in your image editor's native format. For example, if you use Photoshop, save a copy in the PSD format. You might want to save the second copy in high quality JPEG format.



Scan images larger than the scanning area by dividing it into sections

Notebooks, Hand Helds, Cameras, SMS
MP3 Players, Mobiles

Digital World

www.zdnetindia.com/digital

PROCESSING

Snapped and scanned, but satisfied you are not? Here's how you add that touch of class to them!



6

Reducing red-eye effect
Eye pupils dilate in the dark, thus reflecting the flash light in the eye's blood vessels. This gives the person a 'red eye'. Hence, avoid photographing in the dark. If it's absolutely necessary, use a camera with red-eye reduction feature.

Tell the subject do not look directly into the lens. If possible, use a removable flash that is placed at some distance from the camera. You may also use photo management software such as Photoshop album, Picasa, ULead Photo Explorer, JASC to remove red eye.

Cropping
Cropping is used to edit unwanted portions of a photograph. Maintain the aspect ratio for prints when cropping using software. For example, if you need a 5 x 7 print, you will need to crop

the image precisely to that size. Open Photoshop and press [Ctrl] + [R] to enable rulers. Right-click on the ruler, and select Inches to change the ruler unit. Now, drag the horizontal guideline to 5 inches, and position the vertical guideline at 7 inches. Press [C] to switch to the Crop tool, and drag a rectangle of 5 by 7 inches. Move it to a suitable position, and double-click to crop; trying unusual shapes may be a good idea. For example, heart for a couple's photo. Cropping comes handy while correcting horizon lines or straightening your photos.

Automated features
Improve the quality of your photographs by using the automated functions in Photoshop. Go to *Image > Adjustments > Auto Levels* and then apply *Auto Contrast* and

Auto Color. Finally, sharpen them via *Filter > Sharpen > Sharpen*.

Sharpening
You can sharpen any image using Photoshop's Unsharp Mask filter (*Filter > Sharpen > 'Unsharp Mask...'*). This compensates for the blurring caused by the low-pass filter



Use Photoshop's Unsharp Mask filter to sharpen your images that is found in almost all digital cameras to improve image quality. Apply it before the image is re-sized, or resampled, but after other corrections have been done. Its ideal settings would be a radius value of 0.3 to 0.5, threshold value of 0 to 2 and amount between 200 to 500 per cent.

For compensating the blurring done by output process, it should be sharpened after resize/ resample. Generally, finer the print, the lower will be the radius. For example, you will need a radius of 1.0 to 1.5 for photos that are printed on premium inkjet photo paper.

Wipe off dust and scratches
Make use of dust and scratch removal software to get clean scans. One such plug-in is Kodak's Digital ICE (www.asf.com). Apply the noise filter to the photo in Photoshop by going to *Filter > Noise > 'Dust and Scratches...'*. Next, despeckle the image by going to *Filter > Noise > Despeckle*.

You may also use the Clone Stamp Tool to clone a cleaner area to the dusty one. To use this Photoshop tool, press [C] and click on an area that resembles your target area, while holding down [Alt]. After defining the source, release [Alt] and paint in the normal way. Do remember to zoom in and keep the brush size smaller for better results.

Creating panoramas
The latest version of Photoshop CS comes with Photomerge—a feature that allows you to create panoramas in just a few clicks. The best part is that you don't even need to fix your camera on a tripod while taking images, as Photoshop adjusts the level automatically. Open Photoshop CS and click on *File > Automate > Photomerge*. Click on Use Files and use the browse button to locate all the images that want to use for creating the panorama. Make sure that the 'Attempt to Automatically Arrange Source Images' check box is checked, and click OK. A dialog box with

ZDNet India
Where Technology takes you

Biometrics, Anti Virus, Hacking, Product Reviews,
Security Downloads, Firewalls

Security

www.zdnetindia.com/security



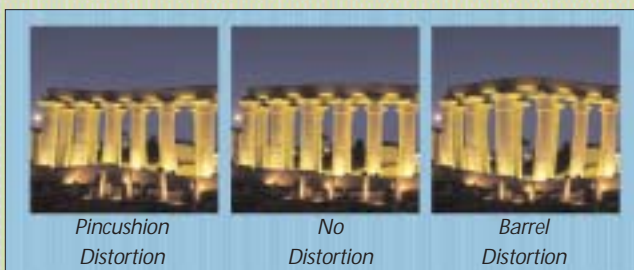
Create an impressive panorama in minutes using Photomerge in Photoshop CS1

your images identified and adjusted comes up. Click OK to accept and use the Crop tool to crop out unnecessary portions.

Visit www.panoguide.com—a Web site dedicated to creating panoramas, for more tips and software.

Distortion correction

Distortion in photographs could be Barrel distortion—a lens effect that leaves photos with a spherical distortion at the centre, or it could be Pincushion distortion, which



results in images that are pinched in the centre.

An easy solution to correct this would be to use the Panorama Tools plug-in for Photoshop that can be downloaded from <http://home.no.net/dmaurer/~dersch/In dex.htm>. Open the ZIP

file, and extract the pano12.dll file in the folder where Photoshop is installed. Now, extract all the files inside the 'Photoshop Plugin' in the ZIP file to the Photoshop Plug-Ins or Filters directory. Restart Photoshop and open the photo in need of correction. First, go to *Filter > Panorama Tools > Correct* to bring up the 'Correct Options' dialog box. Select Radial Shift, and click on the option next to it to bring up the 'Set Polynomial Coefficients for Radial Correction' dialog box. Set 'a' and 'c' to zero for all colours, and choose a value for 'b' and 'd' such that their values add up to one. The values for 'b' should be neg-

ative to correct barrel distortion, and positive to rectify pincushion distortions. Start with 0.015 for 'b' and 0.085 for 'd' to correct pincushion, and -0.015 and +1.015 for barrel distortion. Increase or decrease the values gradually until the

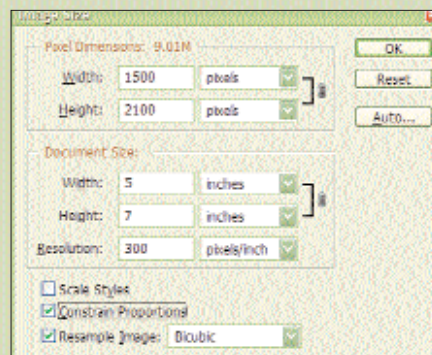
images are corrected properly. Refer to the Readme.html file inside the ZIP file for further details.

Warning!

There are two ways to rotate images in Windows XP. You can right-click on the thumbnail view in Windows Explorer and choose *Rotate Clockwise* or *Rotate Counter Clockwise*, or use the rotate image button in Windows Picture and Fax Viewer. However, every time an image is rotated, it's saved, which results in some loss of quality. Thus, make it a point to use specialised photo-editing software that save only the final image. If you use Photoshop, it would be best to keep saving the image that is being worked upon in the PSD format. Save it in the JPEG format only when you're done with all the editing. The use of the rotate image function in Windows XP should be the last step of your editing process.

Image resolution

Perhaps the most important



Adjust image resolution before printing

thing to keep in mind while printing images is the resolution. Ideally, a 4 x 6 inches photo should have a resolution of at least 800 x 600. For 5 x 7 prints, it should be 1024 x 768 and for 8 x 10 prints, it should be 1600 x 1200 pixels. Furthermore, you need to have a dpi of 300 for sharper, clearer prints. Use Photoshop to change all these parameters. Access them by going to *Image > Image Size*.

Tinting black and white photos

Using photo-editing applications, you can add colour to black and white photos. Open the image in Photoshop. Go to *Image > Mode*, and ensure that the colour mode is RGB or CMYK. Now, press and hold down [Shift] and use the Lasso tool to select a certain area, say, the skin of the photographed person. That done, go to *Image > Adjustments > Variations* and adjust the levels to obtain the desired colour. Now, select other elements in the photograph and adjust the colour variations in the same manner. Use the Path tool for better control over selections.

Finally, create a new layer with 'soft light' blending mode and 85 per cent opacity. Now, use the dodge and burn tool to lighten and darken the

50,000+ Shareware, Freeware, Games, Tools, Utilities, 220 Gigabytes of

Downloads

www.zdnetindia.com/download

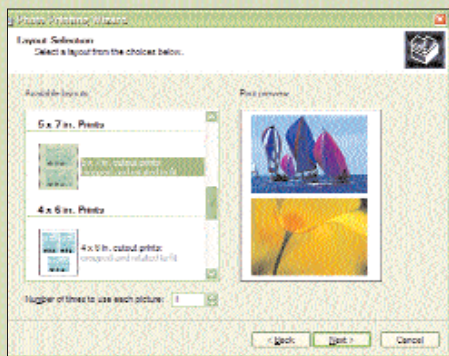


Use Adjust Variations dialog to colorize Black and White Photos.

specific areas to finalise the image.

Print easy

The easiest way to print your images is to use the Photo Printing Wizard in Windows XP. Open the image folder in Windows Explorer, select the images you need to print while holding down [Ctrl] and then click 'Print the selected pictures' under Pic-



Print your images easily with Windows XP's Photo Printing Wizard

ture Tasks. Follow the instructions to print your images in Full Page, Contact Sheet, 8 x 10, 5 x 7, 4 x 6, 3.5 x 5 or Wallet prints.

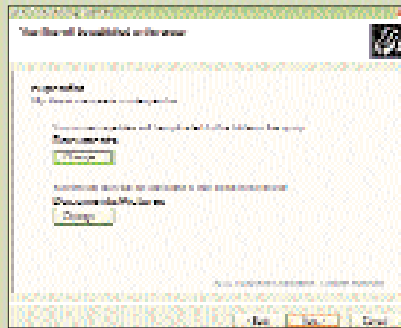
File naming

By default, images downloaded from a digital camera are named as DSCN0001, DSCN0002, ... Use the batch function in Windows XP to rename them. Open the image folder in Windows Explorer, hold down [Ctrl], select all the desired images and press [F2]. Name them appropriately and press [Enter]. If you entered 'birthday', the last selected file will be renamed 'birthday' and the preceding files will be renamed 'birthday (1)', 'birthday (2)', etc.

Photos on the Web

Windows XP's Web Publishing Wizard stores photographs online, as private or public albums. Open the folder that contains your photographs, hold down [Ctrl] and select the pictures you want to share. Next, click 'Publish the selected items to the Web' under 'File and Folder Tasks' to start the Wizard. After you have confirmed the photos you want uploaded, specify its location to the Service Providers in the next screen. Here,

we choose MSN Groups—the standard option. The wizard then gives you the option of keeping your files public or private. Accordingly, you are asked the name of the group



Use Windows XP's Web Publishing Wizard to share your photos easily

and a few other details as part of the registration process. It then displays the Web address of your group. Finally, the Wizard uploads the photos.

E-mailing

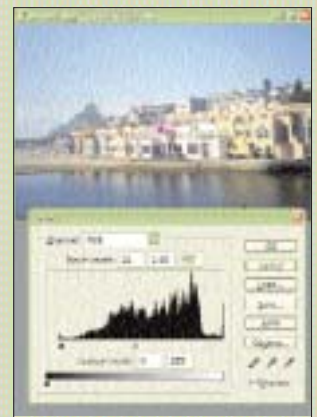
To e-mail photographs, right-click the image in Windows Explorer and choose *Send To > Mail Recipient*. A dialog box in Windows XP provides you with three options to re-size the image prior to e-mailing it: 640 x 480 strictly for computer viewing, 800 x 600 for 4 x 6 prints and 1024 x 768 for 5 x 7 prints. Of course, you can always send it as it is!

Histogram

Exposure is one important factor that differentiates good photos from shoddy ones. A good photo has all its elements illuminated properly. Use the histogram to correct exposure. Though many cameras show a histogram on their LCDs after you take a picture, it's better to view the histogram in a photo-editing tool and make corrections there. Access the

histogram in Photoshop by going to *Image > Adjustments > Levels*.

The right side of the histogram shows the lightest portion or 'highlights' of the images, the middle section shows the mid-tones and the left most side shows the darker portions or 'shadows'. The vertical axis shows the pixels in each



Use Histogram to correct the exposure in your photographs

level. An underexposed image has many pixels concentrated in the shadows. Move the sliders to improve the distribution of brightness levels. Alternatively, use the Auto button to let Photoshop make the adjustments. Further, you can also adjust histogram of channels, i.e red, blue and green, if their distribution appears improper. For example, adjust the histogram for the blue channel if the sky looks dull in your photograph

Buyers Guide, Indian Vendors, Tutorials, Install Guide, Platforms, Maintenance Tips

Server Zone

www.zdnetindia.com/server

Off the Shelf



Halo

Rings of action!

Halo is often described as 'the game that sold the Xbox'. It is the name of a ring-world that orbits an alien planet. A ring-world is a huge planet-like body that is shaped like a ring, and spins like a giant Ferris-wheel. This makes Halo a flat planet, and you can fall off the edge into outer space.

The fledgling human interstellar empire is locked in battle with the Covenant—a group of alien races determined to wipe out human civilisation. You are one of a group of survivors from a devastated colony that is trying to lead the alien armada away from Earth. Your ship is attacked by Covenant



Another Banshee comes screaming down

forces and there's only one place you can run, to Halo of course. Once there, you are sent off instead on mission after dangerous mission to discover the secrets of Halo.

Be prepared for a tough fight—the AI is superlative, making the game much tougher; the scenery is superb; the game saving features are good; the load times are the fastest and smoothest ever.

The game isn't well ported for the PC though—the graphics start to stutter at anything above 1024 x 768; the lack of subtitles makes the story a little difficult to follow; the poor level designs are its biggest flaw, but all this doesn't take away from the fact that you're still having the best PC gaming experience of your life. Be prepared, if *Halo 2* makes it to PC—it could well be the perfect FPS.

Genre: Racing ■ **Developer:** Rockstar Games ■ **Publisher:** Take Two Interactive ■ **System Requirements:** 800 MHz CPU, 128 MB RAM, GeForce2/Radeon 8500, 1.4 GB hard disk space, DirectX 9.0 ■ **Price:** NA ■ **Web site:** www.midnightclub2.com

Rating: ★★★★★



Exam 70-290: Managing and Maintaining a Windows Server 2003 Environment

It's all you need

Microsoft recently presented the networking community with its latest network operating system—Windows Server 2003, and as expected, updated the Microsoft Certified Systems Engineer (MCSE) certification to reflect the company's latest technologies. MCSE and its younger cousin, Microsoft Certified System Administrator (MCSA), are certifications that helps network professionals adjudge their competence in Microsoft's networking technologies. Soon to follow up, Syngress Publishing has come out with a book meant to be a study guide for people aiming for the Exam 70-290—Managing and Maintaining a Windows Server 2003 Environment.

It has 900-odd pages and comes with

a free DVD. The 10 chapters meticulously cover all the exam's objectives—from managing user groups and disk quotas, to remote server management and disaster management. With a walk-through of previous Microsoft operating systems and their key points, the author then sketches the lines that make Windows Server 2003 different from previous servers such as Windows 2000 Server and NT. Each chapter ends with a well thought summary, a checklist of exam objectives, some practical frequently asked questions and a self-test quiz.



Though the book itself leaves no stone unturned in providing a comprehensive, informative and easy-to-grasp learning experience to the reader, the included DVD falls short of expectations. The DVD is essentially a video of an instructor flipping through the various chapters and briefing them with the aid of a PowerPoint presentation. It could have been put to better use, perhaps with quizzes, flash cards, adaptive simulations and the self-test quizzes from the book itself.

All in all, the book is self-sufficient as a study or preparation guide; though don't buy the book for the sake of the DVD.

Publisher: Syngress Publishing ■ **Author:** Dr. Thomas W. Shinder ■ **Distributor:** Shroff Publishers and Distributors Pvt Ltd ■ **Phone:** 91-22-27634290
■ **Fax:** 91-0 22-27634290 ■ **E-mail:** spd@vsnl.com ■ **Web Site:** www.syngress.com ■ **Price:** Rs 750
Rating: ★★★★★

An issue to remember

Badri Narayan, whose expertise in and passion for computer gaming is matched only by Tiger Woods for golf, is a thin man. So is Bhavesh our marketing manager, who matches Badri lost-kilo for lost-kilo. At the peak of their form, both could have been idols for the Rs 25,000-per-fashion-show ramp models. And yet, these two can gobble up food at a pace that would make a 400-pound Sumo wrestler drop his jaw. We would not have known this aspect of their personality if not for Reader Forums, a Digit exercise that, apart from understanding the culinary habits of our colleagues, also let us understand what our readers across the nation expect of us.

us to a place he claims serves the best Gujarati *thalis*. Like every marketing person making a client pitch, he is not the one to give up.

If we thought Ahmedabad was an adventure, our trip to Bangalore seemed a trek of Himalayan proportions, where he promised us a *kabab* and grilled chicken treat. His sense of taste is impeccable, but he is not exactly equipped with a global positioning system. Eight persons in three rickshaws, and only the one that had Bhavesh as navigator ended up at the wrong place! A good kilometre away from the actual destination!

Nevertheless, this delay brought to the fore the gobbling skills of Badri, who had just about an hour to go back to the guest house, pack his stuff and catch a late night flight. Sweet and noble-

ly adventurous pursuit—packing the mega December 2003 Digit issue.

Until now, we were proud of the 70,000 sq ft building that is Jasubhai Digital Media, but the combined might and space of the magazine, the six CDs (these guys didn't break even one!) and the huge cardboard box, humbled us. Every nook and cranny—the lobby, the car park, the corridors, the gym—was populated with temps who were meticulously getting packages into place so to send them all to you. Copies, all of 1,20,000 of them, were oozing out like army ants in the South American rain forests. And just in case we forgot the traffic jam when we returned to our desks, Kaizad, who some time ago betrayed the Digit editorial team to join the client marketing team, passed around a wallpaper bearing the December issue ad.

We had Digit copies coming out of our ears!

Of course, Bollywood hottie Rani Mukherjee's smiling face staring at us from cover helped us a bit. Only a bit, though.

But when the packs were despatched and readers flocked to news-stands like



All good things come in big packages...

A Reader Forum usually has us visiting various parts of the country where the Digit marketing and editorial teams meet up with 10 to 12 readers from each city. Over the last few months, we met readers from Ahmedabad and Bangalore, apart from Mumbai.

Bhavesh, our marketing manager, is a self-professed (stress on "self") gourmet, and claims to have unrivalled knowledge about eating joints in various cities. So in Ahmedabad, for breakfast, he ordered a kilo of *phaphda* (a local fried *papad*-like preparation) and *jalebi* for four persons. Between the four of us, a kilo of phaphda would have lasted days, even if we ate non-stop. We did not undertake this misadventure, and settled for omelettes and bread instead. Not discouraged by this, Bhavesh took

intentioned as he is, we have vowed not to consult Bhavesh in our future endeavours.

December Mega Issue

A few years ago, an ageing Harrison Ford and the now-I-am-lesbian-now-I-am-bisexual-oops-now-I-am-straight Anne Heche starred in a B-grade adventure flick called *Six Days Seven Nights*. We really don't know if our 200-odd temperory hands had seen the movie (our guess is, they haven't), but these guys spent the same amount as Ford and Heche, in an equal-

The Digit magazine, CDs and VCD were packed with the efficiency and precision of an assembly line

kids to a water fight, the entire Digit team—editorial, test centre, marketing, printing, logistics—went home to sleep a deep sleep. The pain was forgotten, the aching body parts ignored. With the new year peeking around the corner, it was time for smiles and much merry making.

Who was the world's first commercial provider of dial-up Internet access?

- a. The World
- b. AOL
- c. CompuServe
- d. MSN

2 Which company pioneered Bluetooth?
 a. Nokia
 b. Motorola
 c. Ericsson
 d. Intel

the first spam e-mails?
 a. Canter & Siegel, a lawfirm
 b. GE
 c. Red Hat
 d. Napster

7 In 1928, a Detroit police officer and an engineering student unveiled a communication device that is being used even now. What are we talking about?
 a. Telephone
 b. Facsimile
 c. One-way Radio
 d. None of the above

c. I2 network
 d. Abilene network

11 Each network card has a unique MAC address. What is the length of this address?
 a. 64 bits
 b. 128 bits
 c. 48 bits
 d. 3 bytes

12 How many root DNS servers are present on the planet?
 a. 100
 b. 405
 c. 13
 d. 456

13 Which was the first Web server to go online?
 a. nxoc01.cern.ch
 b. internet.com
 c. symbolics.com
 d. altavista.com

14 Between which two countries was the first submarine cable laid in 1850?
 a. India and Singapore
 b. USA and England
 c. England and France
 d. Australia and New Zealand

15 Which was the first domain name to be registered?

3 Who sent 'qwertuiop' as the first e-mail in 1971?
 a. Tim Berners-Lee
 b. Ray Tomlinson
 c. Meltcalf
 d. Bill Gates



4 Which organisation was formed in response to the first Internet worm?
 a. CERT
 b. IEEE
 c. ISO
 d. IETF

5 IRC was the first ever real-time chat protocol. Whose brain-child was it?
 a. Jarkko Oikarinen
 b. Paul Allen
 c. Robert Kahn
 d. Steve Wozniak

8 We bow to thee if you know his personal e-mail address. But do you know the President of India's official e-mail address?
 a. president@india.com
 b. thepresident@india.com
 c. president@nic.in
 d. presidentofindia@rb.nic.in

9 This librarian coined the phrase 'Surfing the Internet'. She is also called Net-Mom. Who?
 a. Hillary Clinton
 b. Rachel Jones
 c. Jean Armour Polly
 d. Lady Lovelace

6 Which company has the dubious distinction of sending

Answers	
9. Pv6	c, 15 d.
6. Cisco	12 c, 13 a, 14
7. Internet	10 d, 11 c,
3. E-mail	7 c, 8 d, 9 c,
4. Mantra	4 a, 5 a, 6 a,
2. World Wide Web 1. ARPA	1 a, 2 c, 3 b,
Down:	Across:
Crossword	Quiz

10 What is the name of the next generation network created by the Internet2 consortium?
 a. Nextnet
 b. Intranet

Powered by

did you know

A 'Kasparov Vs The World' chess match was played on MSN.com in 1999. The move that got the highest vote by users was presented in the game. Four experts offered their suggestions for the world. Virtually the entire world followed the suggestions of Irina Krush, a 15-year-old girl from the US. Kasparov won the match.

numberette

The Earth Simulator employs **5,120** CPUs and **10** TB of RAM, and has an output of **40** Tera FLOPS.

digit QUOTIENT

- 1 to 5** Way to go...
- 6 to 10** Good, if you like being mediocre
- 11 to 15** Your next job could be with us!

Got an interesting question? Send it in with the correct answer to quiz@thinkdigit.com

- a. microsoft.com
- b. mit.edu
- c. ietf.com
- d. symbolics.com

- Across**
- The first Web browser/editor used by Tim Berners-Lee
 - Establisher of India's first private Internet gateway
 - January 1, 2003 is the 20th anniversary of...
 - The next version of IP
 - First Web server in Space
 - IE originally used technology licensed from...



- Down**
- The launch of Sputnik resulted in
 - If French call it courriel, we call it
 - The first Ethernet network

- 6. Catalyst Routers
- 8. Vinton Cerf and Robert Kahn